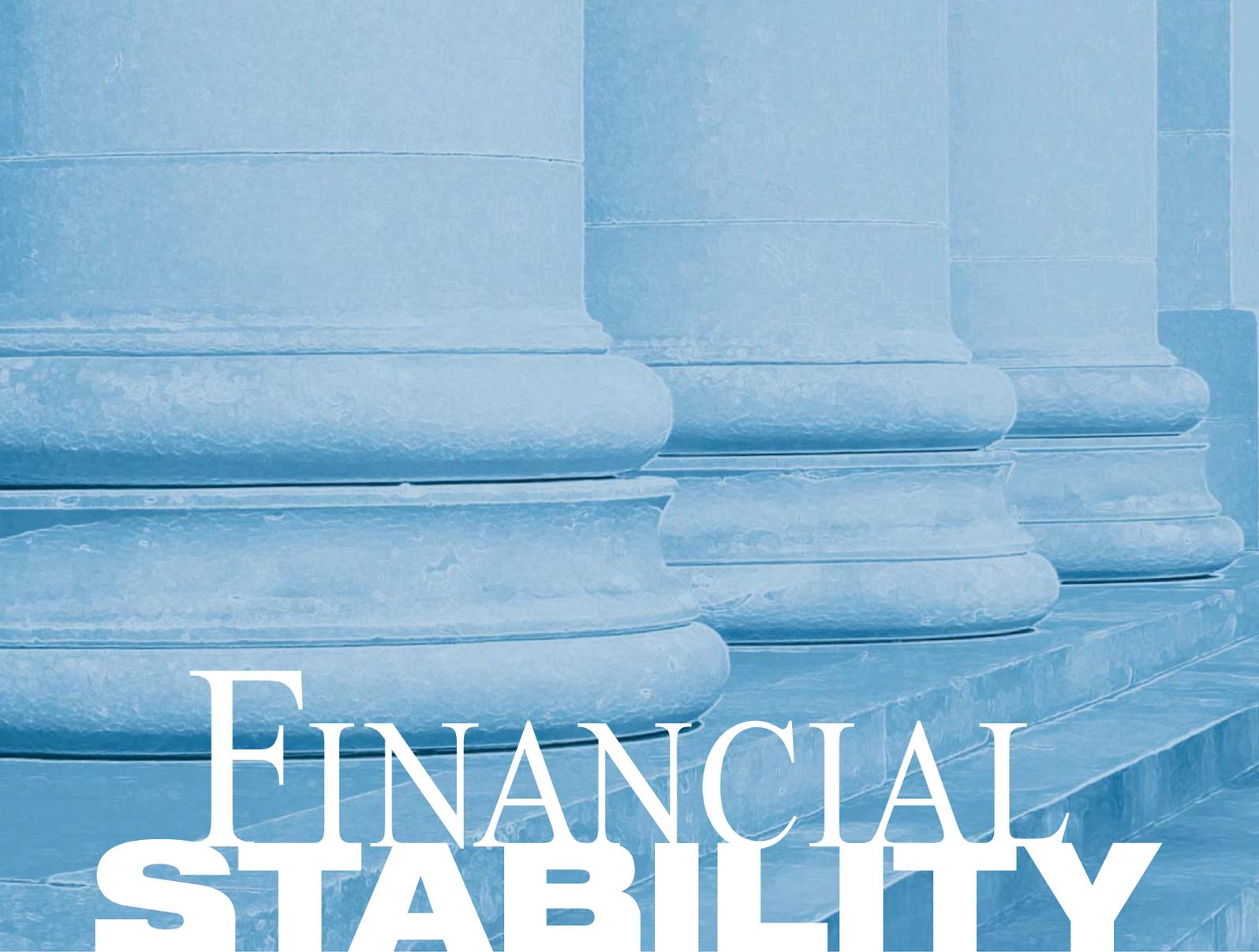


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Introductory remarks

Finance plays a key role in the allocation of resources, i.e. the process of transforming savings into investments, and therefore into economic growth and an increase in the overall level of social welfare. At the same time, because financial stability is based on the confidence of financial market participants, it largely depends in turn on their perceptions and behaviour, which are subject to cyclical swings. As financial crises create considerable economic and social costs, the maintenance of financial stability has the character of a public good and is thus an important economic policy objective.

Financial stability is characterised by the smooth functioning of all financial system segments (institutions, markets, and infrastructure) in the resource allocation process, in risk assessment and management, payments execution, as well as in the resilience of the system to sudden shocks. This is why the Act on the Croatian National Bank, in addition to the main objective of the central bank – maintenance of price stability and monetary and foreign exchange stability – also lists among the principal central bank tasks the regulation and supervision of banks with a view to maintaining the stability of the banking system, which dominates the financial system, as well as ensuring the stable functioning of the payment system. Monetary and financial stability are closely related, for monetary stability, which the CNB attains by the operational implementation of monetary policy, performing the role of the bank of all banks and ensuring the smooth functioning of the payment system, lowers risks to financial stability. At the same time, financial stability contributes to the maintenance of monetary and macroeconomic stability by facilitating efficient monetary policy implementation.

The CNB shares the responsibility for overall financial system stability with the Ministry of Finance and the Croatian Financial

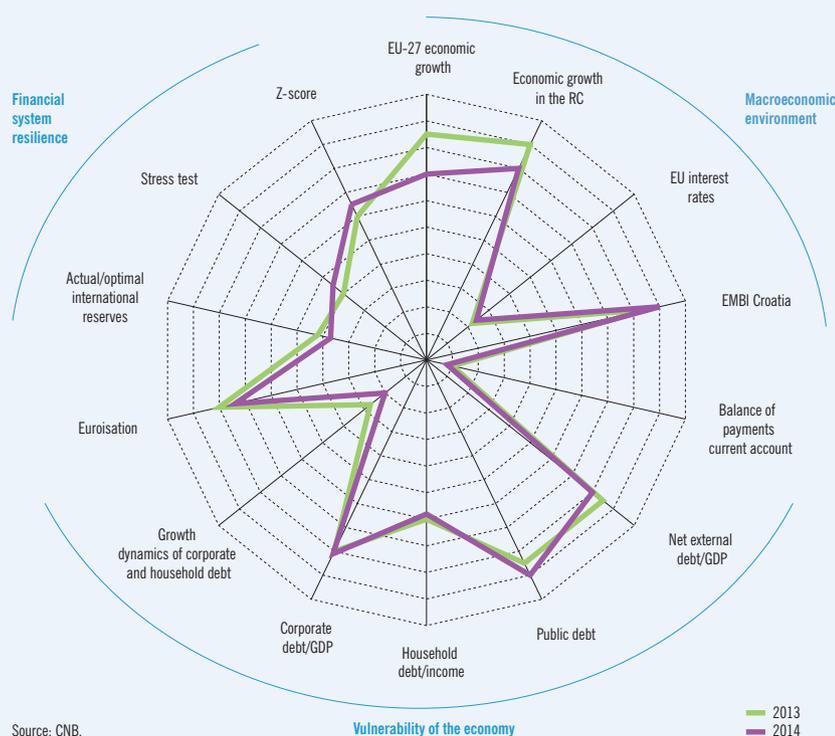
Services Supervisory Agency (HANFA), which are responsible for the regulation and supervision of non-banking financial institutions. Furthermore, owing to the high degree to which the banking system is internationalised, as reflected in the foreign ownership of the largest banks, the CNB also cooperates with the home regulatory authorities and central banks of parent financial institutions.

The publication Financial Stability analyses the main risks to banking system stability stemming from the macroeconomic environment of credit institutions and the situation in the main borrowing sectors, as well as credit institutions' ability to absorb potential losses should these risks materialise. Also discussed are CNB measures to preserve financial system stability. The analysis focuses on the banking sector, due to its predominant role in financing the economy.

The purpose of this publication is systematically to inform financial market participants, other institutions and the general public about the vulnerabilities and risks threatening financial system stability in order to facilitate their identification and understanding as well as to prompt all participants to undertake activities providing appropriate protection from the consequences should these risks actually occur. It also aims at enhancing the transparency of CNB actions to address the main vulnerabilities and risks and strengthen the financial system's resilience to potential shocks that could have significant negative impacts on the economy. This publication should encourage and facilitate a broader professional discussion on financial stability issues. All this together should help maintain confidence in the financial system and thus its stability.

Overall assessment of the main risks and challenges to financial stability policy

Figure 1 Financial stability map



The expected economic recovery in major trading partners and in Croatia contributes the most to the lowering of risks to financial stability. At the same time, the still rising public debt and substantial needs for refinancing of external debt represent a significant risk. Although the contribution of net income to the strengthening of bank capital decreased considerably, stress testing shows that the banking system in Croatia remains capable of absorbing highly unlikely but plausible shocks.

The main financial stability indicators for Croatia are summarised in Figure 1. The financial stability map shows changes in key indicators of the possibility of occurrence of risks related to the domestic and international macroeconomic environment and vulnerability of the domestic economy, as well as changes in indicators of financial system resilience that can eliminate or reduce costs should such risks materialise. The map shows the most recent market developments or projections of selected

indicators and their values in the reference period, i.e. the previous year. For each variable, an increase in the distance from the centre of the map indicates greater risks or system vulnerability and a diminution of its resilience, as well as a greater threat to stability. Hence, an increase in the area of the map suggests an increase in risks to financial stability, while a decrease in the area suggests their reduction.

The gradual economic recovery in major trading partners and the related forecasted slow economic growth in Croatia should contribute to the decrease in financial system vulnerability in 2014. However, the weak dynamics and the considerable negative risks for growth still pose a risk to the country's financial stability. The increase in public debt and the consequent high risk premium will also have a negative impact on the vulnerabilities expected in 2014.

The risk aversion level on the world financial markets remained relatively stable after the Fed announced the gradual withdrawal of monetary stimulus measures despite the initial increased yield volatility in most types of risky assets, like the emerging market countries' bonds and equity indices. However, in contrast with other comparable European countries (with the exception of Slovenia), whose risk premiums decreased in the second half of 2013, the risk premium for Croatia increased substantially (see the Macroeconomic environment section).

The perception of relatively greater riskiness of the Croatian sovereign debt significantly increases the uncertainty regarding the cost of financing in 2014, when the Fed's monetary stimulus is expected to gradually decrease and the yield in the capital market is expected to increase, and the needs for refinancing the maturing debt and financing new debt remain high. The deteriorated risk perception is the result of an ongoing recession, i.e. the absence of recovery, and the associated delay in fiscal consolidation and relatively rapid growth in public debt. Hence, in 2014 it is important to regain the confidence of financial markets and decrease the risk premium through more determined structural reforms and fiscal consolidation and thus support the economic recovery.

The household sector and the private non-financial corporations sector continue to deleverage, so the risks are decreasing, but the levels of business and consumer confidence indices are low. Under such circumstances the economic policy makers attempt to compensate for the absence of private investments by initiating infrastructural projects, and this is noticeable in some extent from the growth in bank placements to state-owned enterprises. The delay of fiscal consolidation was aimed at alleviating the recessionary tendencies in the economy, as suggested by the significant growth in bank placements to the government (see the Banking sector section). However, such a strategy is becoming risky with the relatively high levels and growth rates of public debt. That growth will be decelerated by the excessive deficit procedure launched in Croatia as a member of the EU by the European Union Council at the recommendation of the European Commission in January 2014. In the process of de-

termining the effects of public investments on restraining recession it is important to point out that public investment spending may provide an important incentive, but a permanent and stable recovery will only be possible with an increase in private investments and exports and, after that, with the stabilisation of personal consumption. Hence, the economic policy makers need to continue to carry out reforms to improve the business environment and enable fair and safe competition. This mostly refers to the decrease in administrative barriers and the acceleration of judicial procedures.

In addition, the predictable business environment should also be improved and ensured. Frequent official and unofficial announcements and changes in tax and other laws and regulations increase the uncertainty of the business environment and negatively impact the economic growth rates. Although this volatility is a normal phenomenon in recession and partially arises as a consequence of the response of economic policy makers to major exogenous shocks in the economic system, researches have shown that a decrease in volatility and in the related uncertainty has significant positive effects on economic growth.¹

The ongoing recession, which caused a gradual, but considerable deterioration in bank placement quality, started in 2013 to have a stronger impact on banking system profitability. Even if economic growth is in accordance with the forecasts for 2014, these trends are not expected to discontinue. Even though the signs of a slowdown in the growth of non-performing loans are present, the improvement of bank profitability will only be possible after the current non-performing loans are adequately resolved. As already mentioned in this publication, the pre-bankruptcy settlements and the amended decision on placement classification are the first steps taken by economic policy makers in that direction, and as of end-2012 the banks are autonomously implementing measures for credit portfolio "clean-ups", though still at a slow pace. The economic policy makers should monitor the effects of the implemented measures and use, besides tax policy, other instruments to facilitate the resolution of non-performing loans. All interested parties need to act together and take account of the financial effects of measures on the banking system in the period of ongoing recession.

Banking system resilience analysis indicates that, owing to the adequate capital buffers, the banking system in Croatia is still capable of amortising highly unlikely, but plausible shocks. However, the expected contribution of net income to the strengthening of capital buffers significantly dropped with the decline in banking system profits.

¹ See for example Scott R. Baker and Nicholas Bloom: *Does Uncertainty Reduce Growth? Using Disasters as Natural Experiments*, NBER Working Paper No. 19475, 2013.

Macroeconomic environment

Although the public debt crisis in the eurozone has been brought under control through ESB measures and efforts at fiscal adjustment, the unresolved structural problems in the eurozone and the expected change in the Fed's monetary policy represent the main sources of uncertainty and risks for stability in international financial markets. Croatia needs to implement decisive reforms to improve the investment climate and expectations of entrepreneurs in order to accelerate growth and to decrease the country's risk premium.

Weak economic recovery of the eurozone is the main risk for financial stability. The fiscal adjustment policy in peripheral eurozone countries without a counterbalance in the expansive fiscal policy of countries with budgetary surpluses as well as the absence of credit growth in the conditions of excessive household debt and of a significant number of banks still being burdened by non-performing placements, hamper the economic recovery of the eurozone and strengthen the danger of deflationary pressures (Tables 1 and 2). Such developments increase the risk to debt sustainability in highly indebted countries (Table 3).

Those countries which managed to considerably improve their competitive positions through structural changes have recorded somewhat more favourable developments in the real sector, primarily due to the growth in exports (Tables 2 and 3). A significant impulse to this is provided by the growth in German exports based on imports of components. However, after the formation of a coalition government it is likely that there will be more space for domestic consumption growth in Germany. In the second step this could facilitate recovery and fiscal adjustment in peripheral eurozone countries.

Table 1 Economic growth, exports and industrial production in selected developed and emerging market countries

	Annual GDP growth rate			Quarterly GDP growth rate, $\Delta Q_t/Q_{t-1}$		Annual rate of change in exports of goods		Annual rate of change in industrial production (seasonally adjusted)	
	2012	2013 ^a	2014 ^b	Q2/2013	Q3/2013	Q2/2013	Q3/2013	Q2/2013	Q3/2013
USA	2.8	1.6	2.6	0.6	0.7	1.2	2.6	2.0	2.5
EU	-0.4	0.0	1.4	0.4	0.2	1.6	-0.5	-0.7	-0.7
Germany	0.7	0.5	1.7	0.7	0.3	1.2	-1.0	0.0	0.2
Italy	-2.5	-1.8	0.7	-0.3	0.0	-0.5	0.2	-3.7	-4.2
Slovenia	-2.5	-2.7	-1.0	-0.1	0.0	2.8	4.0	-1.6	-1.3
Slovak R.	1.8	0.9	2.1	0.3	0.2	4.7	0.5	4.4	4.7
Czech R.	-1.0	-1.0	1.8	0.5	-0.1	-1.5	1.2	-2.6	1.0
Poland	1.9	1.3	2.5	0.5	0.6	7.4	7.5	1.1	3.5
Hungary	-1.7	0.7	1.8	0.4	0.9	1.2	1.8	0.7	2.3
Estonia	3.9	1.3	3.0	-0.2	0.6	10.7	-2.5	4.8	2.8
Latvia	5.0	4.0	4.1	0.1	1.3	7.3	-3.9	8.0	0.1
Lithuania	3.7	3.4	3.6	0.6	0.2	12.7	3.0	0.0	0.1
Bulgaria	0.8	0.5	1.5	-0.1	0.5	3.1	7.6	-2.7	-1.4
Romania	0.7	2.2	2.1	0.8	1.6	7.6	14.5	6.6	6.4
Croatia ^c	-1.98	-0.8	0.7	0.2	-0.1	-1.3	-7.4	-2.2	-3.9

^a Estimate. ^b Forecast. ^c The seasonal adjustment methodology of Croatia's GDP has been presented in the manuscript titled Description of the X-12 seasonal adjustment methodology that is available at request.

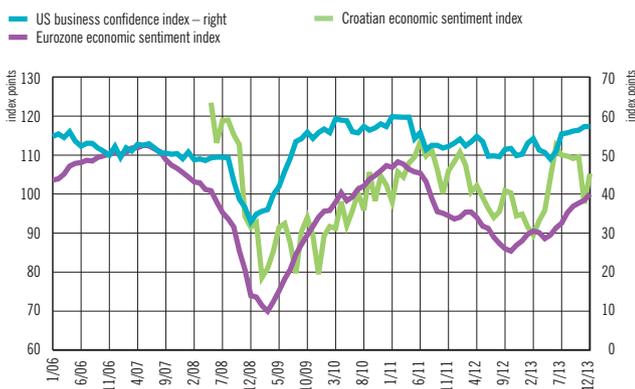
Sources: Eurostat, CBS, Bloomberg, OECD and CNB (for Croatia).

The stabilisation of the government bond market continued in 2013 (Figures 4, 5, 6, and 7). This was attributable to the considerable drop in risk premiums under the influence of the ESB's introduction of the outright monetary transaction programme at the end of 2012. A short-term, unstable period was marked only after the Fed announced a possible decrease in

bond purchase, which caused, though only temporarily, an increase in yields on bonds.

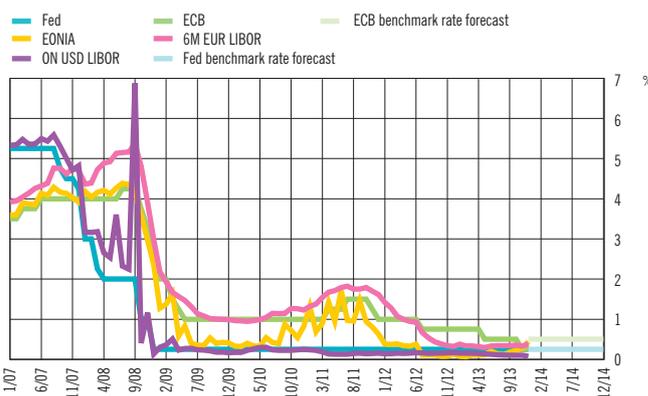
Progress in the formation of a banking union is the major precondition to a sustainable stabilisation of risk premiums in peripheral countries. The successful ending of the assistance

Figure 2 Economic sentiment and business confidence indices



Sources: Bloomberg and CNB.

Figure 3 Key interest rates of the main central banks and leading market interest rates



Sources: Fed, ECB and Bloomberg.

Table 2 Fiscal balance and current account balance in selected developed and emerging market countries

	Fiscal balance, as % of GDP (ESA 95)			Current account balance, as % of GDP		
	2012	2013 ^a	2014 ^b	2012	2013 ^a	2014 ^b
USA	-9.1	-6.4	-5.7	-2.7	-2.6	-2.7
EU	-3.7	-3.1	-2.5	0.9	1.6	1.7
Germany	0.1	0.0	0.1	7.0	7.0	6.6
Italy	-3.0	-3.0	-2.7	-0.5	1.0	1.2
Portugal	-6.4	-5.9	-4.0	-1.9	0.9	0.9
Ireland	-8.2	-7.4	-5.0	4.4	4.1	4.0
Greece	-9.0	-13.5	-2.0	-5.3	-2.3	-1.9
Spain	-10.6	-6.8	-5.9	-1.2	1.4	2.6
Slovenia	-3.8	-5.8	-7.1	3.1	5.0	6.0
Slovak R.	-4.5	-3.0	-3.2	1.6	4.3	4.3
Czech R.	-4.4	-2.9	-3.0	-2.6	-1.6	-1.1
Poland	-3.9	-4.8	4.6	-3.3	-1.5	-1.3
Hungary	-2.0	-2.9	-3.0	1.1	3.0	2.7
Estonia	-0.2	-0.4	-0.1	-2.8	-2.1	-2.2
Latvia	-1.3	-1.4	-1.0	-2.5	-1.6	-2.0
Lithuania	-3.2	-3.0	-2.5	-1.1	-0.5	-0.8
Bulgaria	-0.8	-2.0	-2.0	-1.3	0.3	0.0
Romania	-3.0	-2.5	-2.0	-4.0	-1.2	-1.5
Croatia	-5.0	-5.9	-4.6	0.0	0.9	1.5

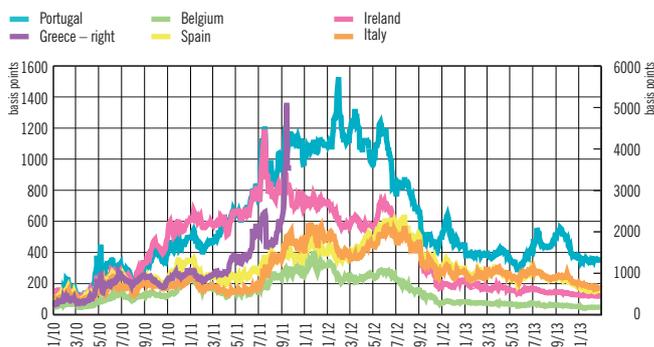
^a Estimate. ^b Forecast.

Sources: European Commission, *European Economic Forecast*, fall 2013 and CNB (for Croatia).

programme and the issuance of Irish government bonds in the international market, which should be followed by Portugal in mid-2014, and the first signs of fiscal stabilisation in Greece caused the strengthening of the credibility of policies focused on financial stabilisation in the eurozone. The major incentive to a more permanent stabilisation, however, is expected from progress in the formation of the banking union, which enters its critical phase at the turn of the year. Namely, after the agreement on a single ECB supervision of major banks in eurozone countries, at the end of the year a political agreement was made on forming a single resolution mechanism. The aim of that mechanism is to ensure the separation of the banking sector and public finance in every country, and by doing so to eliminate considerable risks to public debt stability.

The agreed, compromise, solution encompasses the inclusion of owners and other unprotected creditors, limited use of national funds in the transitional period and, in the last step, a joint fund at eurozone level which would be gradually financed in the subsequent ten years from banking fees. However, the problem remains open because national funds still have not secured prior financing, and so full separation from state finance in some countries still has not been ensured. The sufficiency of the joint fund is also questionable with regard to the size of assets of the eurozone banking system.

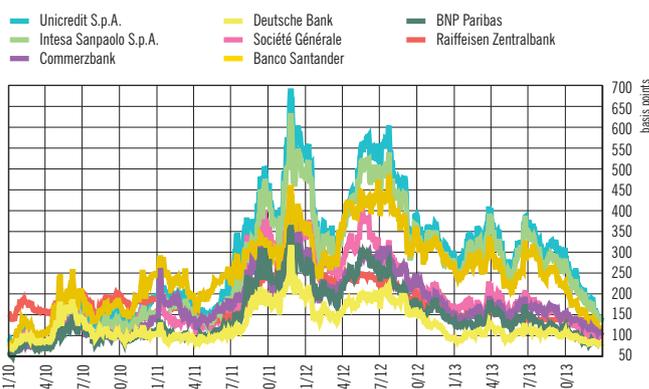
Figure 4 CDS^a spreads for 5-year bonds of selected eurozone countries



^a Credit default swaps (CDS) spread is an annual premium that a CDS buyer pays for protection against credit risk associated with an issuer of an instrument.

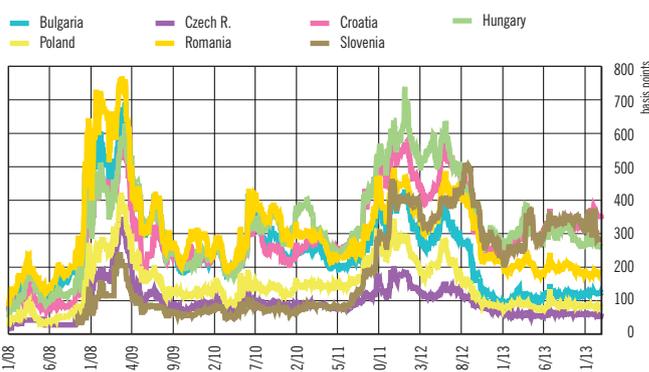
Source: Bloomberg.

Figure 5 CDS spreads for 5-year bonds of selected banks



Source: Bloomberg.

Figure 6 CDS spreads for 5-year bonds of selected emerging market countries



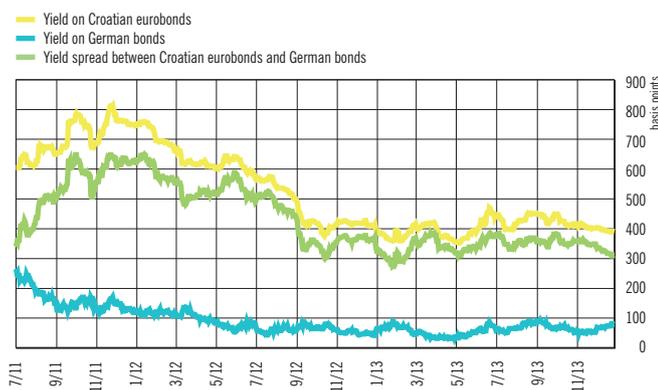
Source: Bloomberg.

Figure 7 EMBI spreads



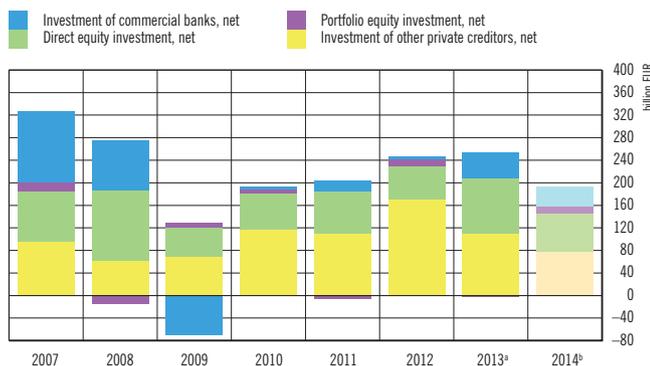
Source: J. P. Morgan.

Figure 8 Yields on Croatian and benchmark German bonds maturing in 2018 and their spread



Source: Bloomberg.

Figure 9 Capital inflows to European emerging market countries



^a Estimate. ^b Forecast.

Source: International Institute of Finance, *Capital Flows to Emerging Market Economies*, October 2013.

Table 3 Public and external debt in selected European emerging market countries

as % of GDP

	Public debt			External debt		
	2012	2013 ^a	2014 ^b	2011	2012	6/2013
Italy	127.0	133.0	134.0	115.0	122.9	123.0
Portugal	124.1	127.8	126.7	217.9	237.3	236.7
Ireland	117.4	124.4	120.8	1062.2	1021.0	
Greece	156.9	176.2	175.9	177.4	229.8	224.5
Spain	86.0	94.8	99.9	164.9	170.0	167.5
Slovenia	54.4	63.2	70.1	111.3	117.3	115.9
Slovak R.	52.2	54.3	57.2	76.7	73.9	80.1
Czech R.	46.2	49.0	50.6	46.8	51.6	51.7
Poland	55.6	58.2	51.0	67.0	73.8	70.8
Hungary	79.8	80.7	79.9	161.6	159.6	156.5
Estonia	9.8	10.0	9.7	97.2	99.8	91.9
Latvia	40.6	42.5	39.3	145.5	138.1	136.5
Lithuania	40.5	39.9	40.2	77.8	77.1	69.8
Bulgaria	18.5	19.4	22.6	95.0	98.4	94.7
Romania	37.9	38.5	39.1	76.1	77.4	74.3
Croatia	55.5	64.1	66.8	101.8	102.5	105.8

^a Estimate. ^b Forecast.

Sources: Eurostat, World Bank, *Quarterly External Debt Statistics* and CNB (for Croatia).

An efficient solution needs to be implemented before the ECB takes over the supervision of banks at the end of 2014. Prior to that, an asset quality analysis of 130 major banks will have to be conducted, as well as stress testing of banks in cooperation with EBA in order to assess the adequacy of their capitalisation.

The introduction of a resolution mechanism is necessary in order not only to separate the banking from the government sector in every country but also to substitute for the semi fiscal role of the ECB. The ECB took that role with the outright monetary transaction programme, and indirectly through long-term refinancing operations used to ensure banking sector liquidity which is mostly used in peripheral countries for the purchase of government bonds.

The continued uncertainty in terms of results of asset quality analysis, and reliance on writing-off of creditor claims, alongside limitation of the role that the country has in saving banks, could limit the possibility for capital-raising by banks through markets. This could prompt the banks to decrease the need for capital required by the new Basel regime by decreasing assets, especially in banks in which the asset quality analysis shows significant potential losses. The consequences of this could be reflected in a new wave of bank deleveraging and in an additional fall in their credit activity, which might have a negative impact on the economic recovery.

The Fed's decrease of the securities purchase programme which started at the beginning of 2014 is a potential source of

a considerable yield growth in the bond markets. This could destabilise the financial systems of countries with high imbalances and great exposure of financial institutions to country risk, and trigger capital outflow from emerging market countries and endanger the possibility for economic recovery (Tables 2 and 3). Such developments could cause a new financial crisis. Taking that into account, the Fed is attempting to create an exit strategy whereby the decrease in securities purchase will not also imply the effective tightening of monetary policy. This could be achieved with certain measures which would hinder the growth in the entire yield curve.

With respect to the strong influence of the Fed's policy on monetary and financial conditions in world markets, the ECB also plans to use various measures to neutralise the effects of the Fed's activities on yields in eurozone markets. The aim is to maintain a relaxed character in ECB monetary policy and provide support to the still weak economic recovery and prevent the danger that the risk of deflation will be strengthened (Figure 3). Among other things, ECB activities could include ensuring additional liquidity on the basis of a new programme of long-term refinancing operations along with the initiative to burden the government bonds with capital requirements in order for the banks to redirect their efforts from government to private sector financing, and to strengthen the stability of banks in circumstances of possible yield growth and the respective potential losses. This would also eliminate the potential conflict between the ECB's objectives of maintaining price and financial stability.

Risks of decrease in capital inflows in emerging market countries are rising. The mentioned attempts by the banks to increase capitalisation would have a negative impact on placement growth, especially cross-border placement growth, and this, alongside the probable increase in yields on US bonds, may decrease the capital inflow in emerging market countries (Figure 9). That is a significant change in relation to the situation in 2013 when, in search of higher yields, capital surpluses were directed to riskier placements. Such a scenario would hit the most those countries with major external imbalances and needs for refinancing of mature debt (Tables 2 and 3).

Under such circumstances the process of forming a banking union in eurozone is even more important. A successful formation of such a union would have a favourable impact on cross-border capital flows and it would reverse the tendencies towards the renationalisation of banking and financial markets that have had an unfavourable impact on financing conditions in peripheral countries. This particularly refers to the segment of small and medium-size entrepreneurship, which is important in the process of economic recovery and a decrease in unemployment. With regard to this, the ECB is attempting to figure out a way in which to connect the use of additional liquidity with placements in that sector.

Due to slow reforms, the domestic fundamentals deteriorated and the country risk premium increased. The Croatian economy failed to use the improvement of financial conditions on capital markets in 2013 for increasing growth, so the post-crisis recession

extended to the fifth consecutive year, with an estimated GDP fall of around 0.8% (Figures 10 and 11). The unfavourable investment climate due to the absence of any very strong structural reforms, and weak business expectations decreased investment activity, while household deleveraging and growing unemployment made the growth of personal consumption impossible. At the same time, exports of goods decreased due to a delayed restructuring of important export sectors (shipyards, oil and chemical industry) and due to the country's departure from CEFTA.

Such developments led to a growth in net aggregated savings of the private sector and at the same time to a growth in negative net savings of the government sector, so the current account recorded a slight surplus of around 0.9% of GDP (Figure 12). The increase of the general government sector deficit from

Figure 10 Foreign capital inflows and GDP growth in Croatia

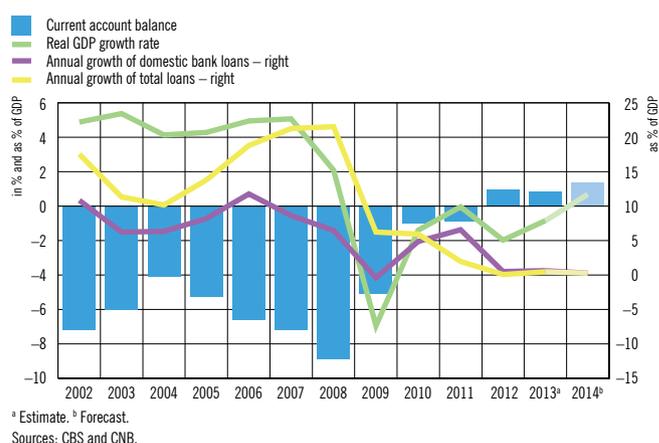


Figure 11 GDP growth pattern (contribution to growth)

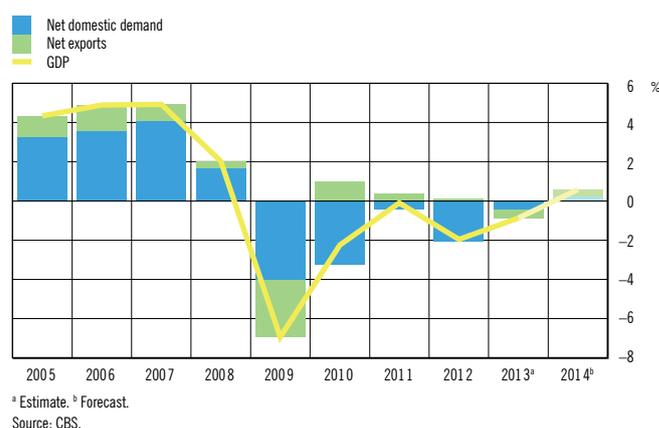


Figure 12 Savings and investment – total and by sector

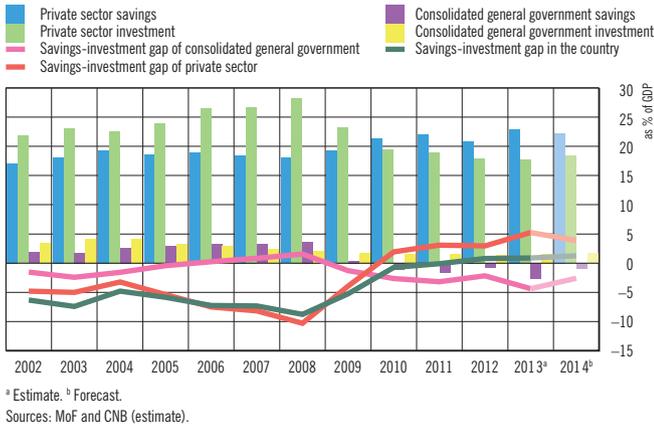


Figure 15 Short-term external debt

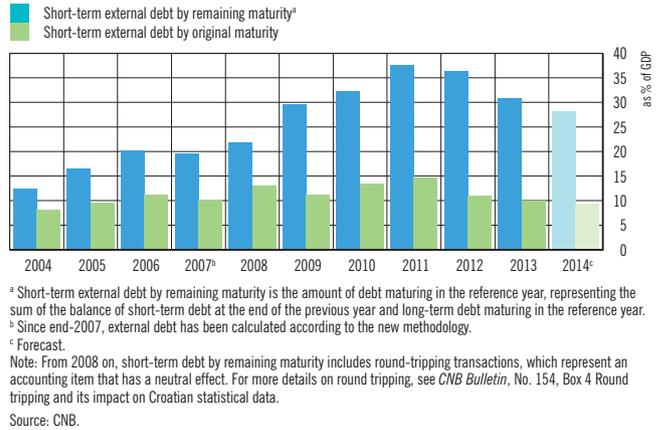


Figure 13 External debt by domestic institutional sector

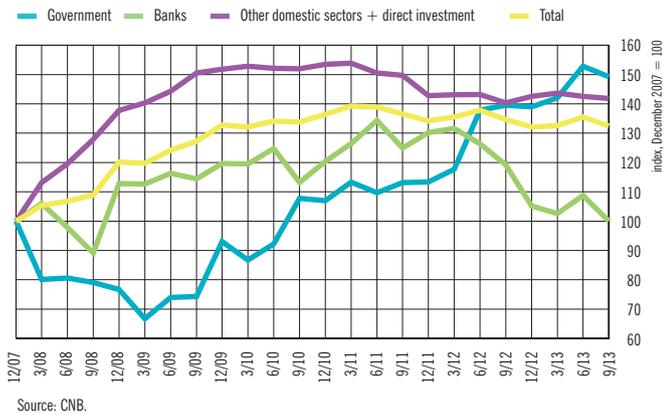


Figure 16 Selected indicators of external vulnerability

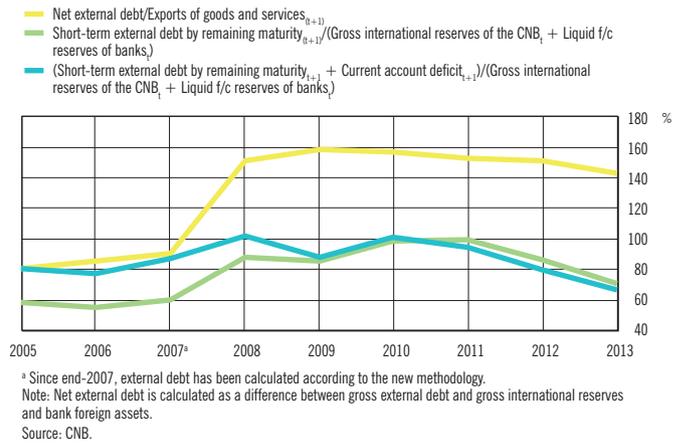


Figure 14 Total external debt by creditor

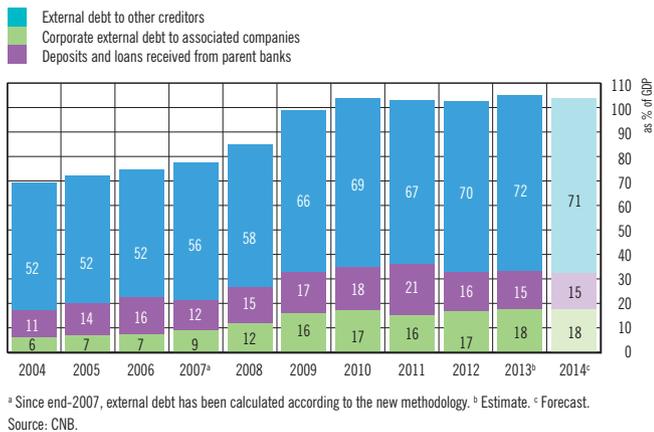


Figure 17 Projection of external debt principal payments in 2014 by sectors

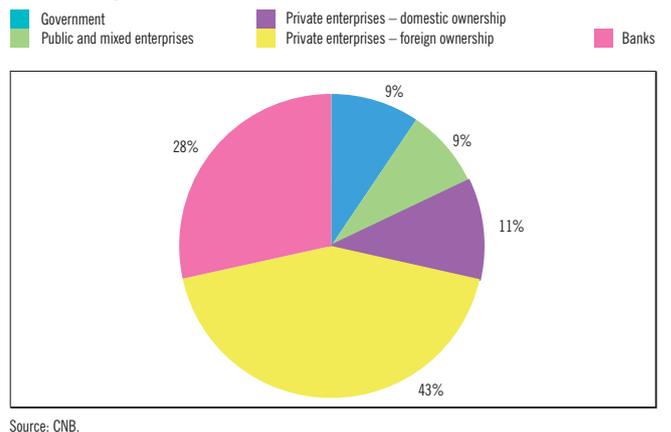
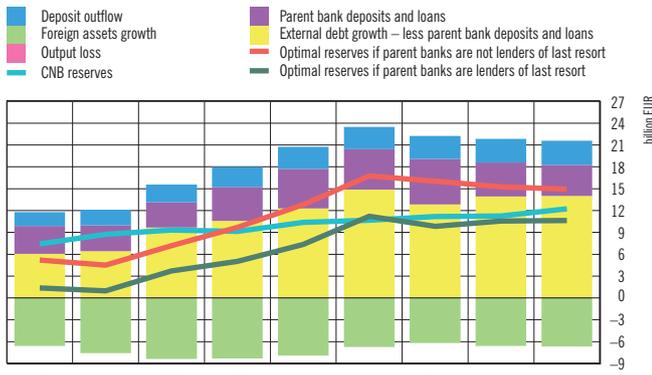


Figure 18 Optimal international reserves – contribution of individual components



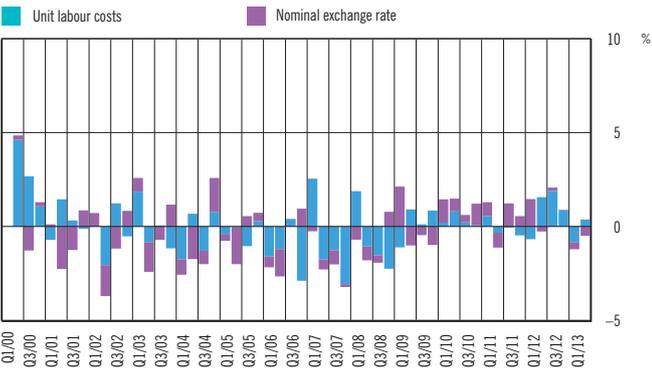
Source: CNB.

Figure 19 Real kuna/euro exchange rate



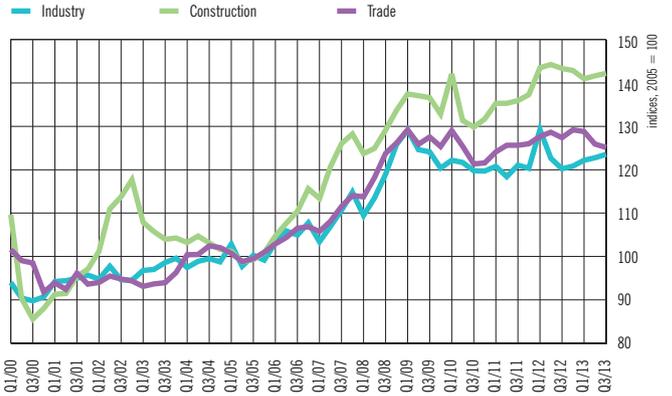
Note: A fall in the index indicates a real appreciation of the kuna against the euro.
Sources: CBS, CNB and CNB calculations.

Figure 20 Decomposition of real kuna/euro exchange rate – quarterly change



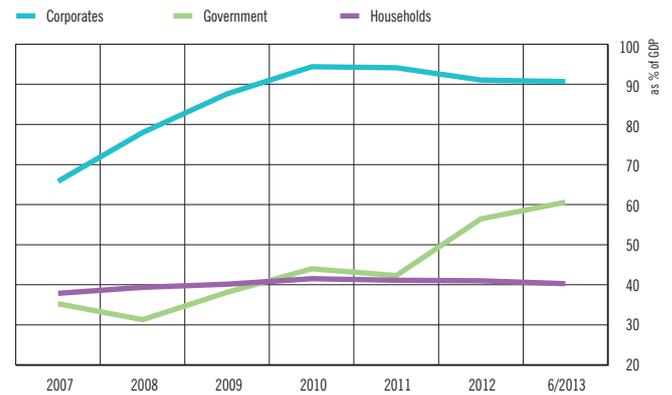
Sources: CBS, CNB and CNB calculations.

Figure 21 Unit labour cost



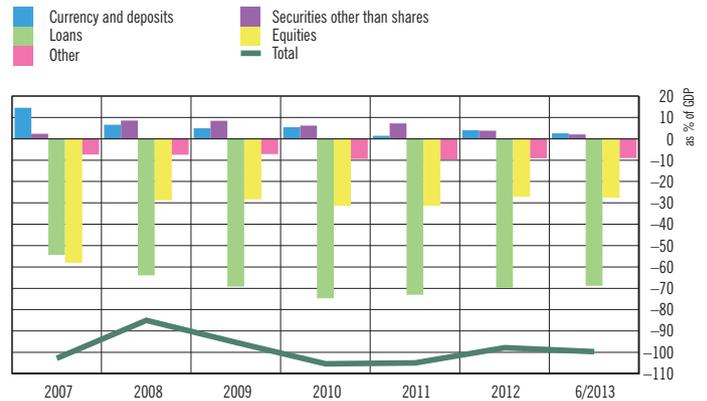
Sources: CBS and CNB calculations.

Figure 22 Total debt by sector



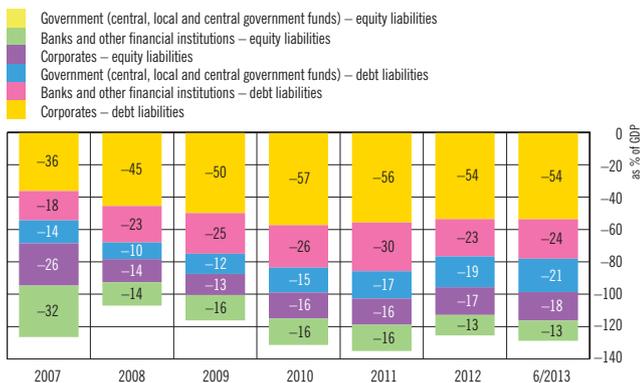
Source: CNB – financial accounts.

Figure 23 Net position of domestic sectors with respect to the rest of the world by instrument



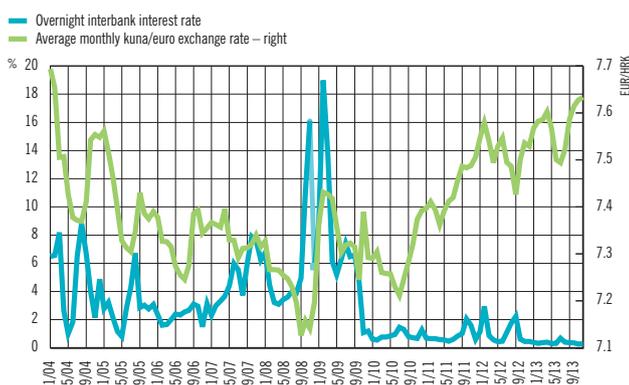
Source: CNB – financial accounts.

Figure 24 Net financial position of selected domestic sectors with respect to the rest of the world by equity and debt instrument



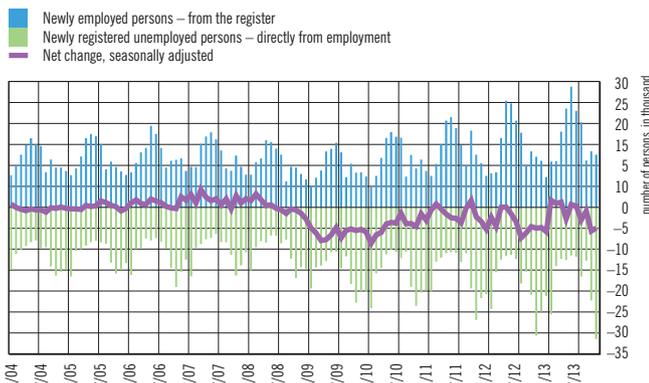
Source: CNB – financial accounts.

Figure 25 Kuna/euro exchange rate and overnight interest rates



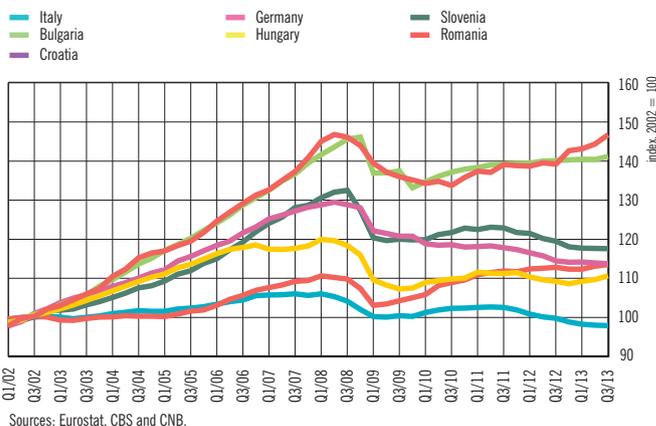
Source: CNB.

Figure 26 Changes in employment registered with the Croatian Employment Service (CES)



Sources: CES and CNB calculations.

Figure 27 Gross domestic product, seasonally adjusted data in constant prices



Sources: Eurostat, CBS and CNB.

5.0% in 2012 to 5.9% in 2013 and the consequent growth in public debt from 55.5% of GDP to 64.1% of GDP, alongside cyclical factors, were attributable to the short-term effects of tax policy changes focused on financial strengthening of the corporate sector as well as settlement of due liabilities in the health care system (Table 2, Figures 13, 14 and 15).

The rising budget deficit and the maturing public debt are mostly funded from sources in the external market (Tables 2 and 3, Figure 13). Hence despite the private sector deleveraging, a net foreign capital inflow was achieved (Figure 22). With respect to the current account balance surplus, this caused a growth in international reserves. Such developments contributed to the improvement of external liquidity of the country and the maintenance of international reserves of the monetary system at optimal level (Figure 18).

Under such circumstances the kuna exchange rate remained stable without substantial interventions by the central bank on the foreign exchange market, which, alongside the decrease in prices of imported raw materials, caused inflation to drop to a level lower than 2% (Figure 25).

However, a high level of external debt, which stood at around 105.0% of GDP at the end of 2013, represents a significant vulnerability to possible shocks in conditions of external funding (Figures 13, 14, 15, 16 and 17). This is particularly so because the absence of economic growth and the deterioration of the budget balance as well as the growth in public debt resulted in the decline in the country's credit rating from investment to speculative level and in the increase of the country's risk premium (Figures 7 and 8). This increased the government borrowing costs on the foreign market, and the risks related to the sustainability of public debt also increased.

Table 4 Financial accounts for Croatia

as % of GDP

Liabilities		Claims												Total liabilities	
		Domestic sectors										Rest of the world			
		Corporates		Financial sector		General government		Households		Total					
		2012	6/2013	2012	6/2013	2012	6/2013	2012	6/2013	2012	6/2013	2012	6/2013		
Corporates	Monetary gold and SDRs	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Currency and deposits	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Securities other than shares	0	0	2	2	0	0	0	0	2	2	5	4	7	7
	Loans	0	0	42	41	0	0	0	0	42	41	43	43	85	84
	Shares and equity	24	24	3	4	29	29	16	16	73	73	24	25	97	98
	Insurance technical provisions	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Other claims and liabilities	31	31	1	1	6	6	2	2	40	40	12	12	52	52
	Total	55	55	49	48	35	35	18	18	157	156	83	84	240	240
Financial sector	Monetary gold and SDRs	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Currency and deposits	12	13	22	21	3	4	59	59	96	96	12	14	108	111
	Securities other than shares	0	0	0	0	0	0	0	0	1	1	1	1	2	2
	Loans	0	0	8	7	0	0	0	0	8	7	22	21	30	28
	Shares and equity	1	2	3	4	11	10	3	4	18	20	16	15	33	36
	Insurance technical provisions	1	1	1	1	0	0	22	23	24	25	0	0	24	25
	Other claims and liabilities	1	1	0	1	0	0	1	1	3	2	1	0	4	3
	Total	16	17	34	34	13	14	86	87	149	151	52	52	201	203
General government	Monetary gold and SDRs	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Currency and deposits	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Securities other than shares	0	0	25	27	0	0	0	0	25	27	15	16	39	43
	Loans	0	0	12	12	0	0	0	0	12	12	5	5	17	18
	Shares and equity	0	0	0	0	26	25	0	0	26	25	0	0	26	25
	Insurance technical provisions	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Other claims and liabilities	8	8	0	0	0	0	0	0	8	8	0	0	8	8
	Total	8	8	37	39	26	25	0	0	70	72	20	21	90	94
Households	Monetary gold and SDRs	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Currency and deposits	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Securities other than shares	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Loans	0	0	41	40	0	0	0	0	41	40	0	0	41	40
	Shares and equity	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Insurance technical provisions	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Other claims and liabilities	0	0	1	0	0	0	0	0	1	0	0	0	1	0
	Total	0	0	42	40	0	0	0	0	42	40	0	0	42	41
Rest of the world	Monetary gold and SDRs	0	0	1	1	0	0	0	0	1	1	0	0	1	1
	Currency and deposits	0	0	12	13	0	0	3	3	16	16	0	0	16	16
	Securities other than shares	0	0	24	24	0	0	0	0	24	24	0	0	24	24
	Loans	0	0	1	1	0	0	0	0	1	1	0	0	1	1
	Shares and equity	7	7	6	6	0	0	0	0	13	13	0	0	13	13
	Insurance technical provisions	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Other claims and liabilities	3	3	0	0	0	0	0	0	3	3	0	0	3	3
	Total	10	10	44	45	0	0	3	3	58	58	0	0	58	58
Total	Monetary gold and SDRs	0	0	1	1	0	0	0	0	1	1	0	0	1	1
	Currency and deposits	12	13	34	33	3	4	63	62	112	112	12	14	124	127
	Securities other than shares	0	0	51	53	0	0	0	0	52	54	20	22	72	75
	Loans	0	0	103	101	0	0	0	0	103	101	70	69	174	170
	Shares and equity	32	32	13	14	65	65	19	20	128	132	40	41	168	172
	Insurance technical provisions	1	1	1	1	0	0	22	23	24	25	0	0	24	25
	Other claims and liabilities	43	43	3	2	6	6	4	3	55	54	12	12	68	66
	Total	88	89	205	206	74	75	107	108	475	478	155	158	631	636

Source: CNB.

In order to maintain exchange rate and financial stability in 2014 and in the upcoming years it is of great importance, through the implementation of structural reforms, to improve the investment climate and increase the dynamics of economic growth. This would facilitate the necessary fiscal adjustment and ensure a decrease in the risk premium, an improvement in the country's credit rating and of funding conditions for the government and the private sector. The necessity of strengthening domestic fundamentals and the consequent decline in the risk premium additionally gain importance in conditions in which the reorientation of capital towards the US market due to the mentioned change in the Fed's monetary policy is likely to result in the increase in yields on bonds in major financial markets.

The main contribution to the economic recovery in 2014 is expected from the growth in exports triggered by the recovery of growth in the EU as the main export market (Table 1). A major contribution is also expected from the growth in investments in the public sector, but for long-term dynamic growth the most important thing is private sector investments in the tradable goods and services sectors which will improve corporate competitiveness, especially on the basis of the technological level, innovations and quality.

The growth in exports and investments, and thus also the reforms required for their stimulation, are also important because household consumption has come to a halt through deleveraging, while public consumption needs to be decreased since in 2014 Croatia enters the EDP process in order to decrease the public sector deficit to a level lower than 3% of GDP by 2016 and to ensure the decrease of public debt to a level lower than 60% of GDP.

The banking sector, even though burdened by the decreased profitability due to the growth of non-performing loans caused by a prolonged recession, should not be a bottleneck in ensuring financial support to the private sector. The reasons for this are the high capital adequacy of the majority of the banking sector and additional liquidity supply ensured by the CNB through the decreased reserve requirement rate. However, a growth in private sector demand is crucial for the increase in loans and it may be triggered by the improvement in business expectations caused by the recovery in the EU and the improvement of the business climate in the country.

Box 1 High-frequency financial stress indicators

The recent global financial crisis additionally raised the issue of importance of a timely and efficient response of microprudential and macroprudential policy both in Croatia and in the world. Therefore a need arises for early and accurate measurement of stress levels and for detecting systemic stressful episodes in the financial system. In the last couple of years great efforts have been put into the development of high-frequency indicators or financial stress indices¹, which are mostly based on infor-

mation from the financial markets. The objective of such indices is to ensure measurement of financial stress in the financial system almost in real time using information from various markets in order to increase accuracy. Additionally, such indices may be used as indicators of a stressful episode which may have a negative effect on real economic developments in the near future and as such be of use to policy makers for the timely activation and deactivation of macroprudential instruments (see Box 5 Monitoring systemic risks and shaping macroprudential policy). That is, if the disturbances signalled by high-frequency indicators last, it is assumed that they are not one-off occurrences and will in the near future be reflected in the low-frequency indicators, i.e. the real economy.

Table 1 Overview of indicators used for the calculation of the financial stress index and their individual relative combined significance

IFS1	CDS of parent banks	7.95%	6.55%			12.77%		17.60%	17.88%
	Idiosyncratic volatility of EMBI	13.01%	5.91%			13.54%		6.54%	6.36%
	EMBI spread	1.08%	4.07%			13.36%		17.17%	17.46%
	EURIBOR/EUREPO spread	4.63%	5.07%			9.06%		17.55%	14.40%
	EURIBOR	14.34%	9.74%			8.63%		6.89%	1.39%
	EUR/HRK and CHF/HRK weighted exchange rate	16.86%	19.25%			3.86%		11.49%	11.84%
	Weighted exchange rate volatility	14.33%	17.10%			13.73%		8.29%	7.80%
	ZIBOR O/N	9.40%	16.01%			15.23%		5.21%	8.52%
	CROBEX	18.40%	16.30%			9.82%		9.26%	14.35%
IFS2	CDS of parent banks	0.00%		0.00%	8.33%	4.26%		44.00%	
	Idiosyncratic volatility of EMBI	2.78%		24.66%	8.33%	13.56%		1.00%	
	EMBI spread	2.78%		4.11%	6.25%	21.54%		15.00%	
	EURIBOR/EUREPO spread	3.33%		20.55%	4.17%	14.36%		21.00%	
	EURIBOR	12.78%		16.44%	4.17%	10.90%		12.00%	
	EUR/HRK and CHF/HRK weighted exchange rate	34.44%		0.00%	2.08%	3.72%		3.00%	
	Weighted exchange rate volatility	43.89%		0.00%	2.08%	7.18%		1.00%	
	ZIBOR O/N	0.00%		5.48%	16.67%	11.70%		2.00%	
	CROBEX	0.00%		28.76%	47.92%	12.78%		1.00%	
IFS3	Bond market				26.42%	27.12%	32.31%	33.68%	
	Money market				24.28%	28.35%	19.36%	26.09%	
	Capital market				31.94%	27.92%	35.38%	24.22%	
	Foreign exchange market				17.36%	16.61%	12.95%	16.01%	
Period of stress episode (in months)	9/2002 – 6/2003 (10)	12/2003 – 1/2004 (2)	9/2007 – 12/2007 (4)	1/2008 – 3/2008 (3)	9/2008 – 12/2009 (16)	4/2010 – 6/2010 (3)	7/2011 – 12/2011 (6)	8/2012 – 9/2012 (2)	

Note: 1 Periods of increased stress are identified by the use of Markov-Switching model which classifies the financial market outlook into one of the two regimes (stress and normal regime) at any time. 2 Relative combined significance of the individual indicator statistically reflects its share in the chosen index (combination). 3 Weights in the EUR/HRK and CHF/HRK weighted exchange rate represent the share of euro- and Swiss franc-denominated loans, respectively, in total loans. 4 Idiosyncratic volatility of the EMBI index is difference between the volatility of EMBI index for eurozone and the volatility of EMBI index for Croatia. Sources: CNB and Bloomberg.

Financial stress implies difficulties in the normal functioning of financial markets, which mostly include increased uncertainty regarding the value of financial assets and the expectations of future economic developments, and most commonly reflect in the increased price volatility in financial markets.² The objective of the research presented in this box is primarily to measure financial stress, which may, but also may not, result in a considerable spillover to the real sector i.e. the balance sheets of financial intermediaries.

This spillover depends on the strength and the frequency of external shocks, on the autonomous ability of the financial system to absorb them (resilience level) and of course, on the reactions of macroprudential and microprudential policy makers prior to and during such episodes. This publication has already discussed those problems and their measurement (Financial stability No.11, Box 1 Systemic risk indicators).

For the construction of a financial stress index, the literature most commonly suggests daily or intraday data for the securities market and foreign exchange and money markets indicators, as well as banking sector data. It is necessary to take into account that indicators should encompass a significant number of financial markets (there is a realistic possibility that the disruption in a certain financial market will not spill over to other markets for example from the capital market) and that indicators reflect a relatively significant number and volume of financial transactions (a shallow market may indicate disruptions that are not significantly connected to financial stress and vice versa; primarily, with a relatively low number of traded shares, the disruption detected due to an increased volume of trading in one of them need not reflect financial stress). Furthermore, Illing and Liu (2006) point out that such indices are very useful for the analysis of developments in highly advanced markets with numerous financial instruments and indicators, but, provided the indicators used for index calculation are adjusted, they may also be used in countries with more poorly developed financial markets.

In line with that, while the financial stress indicators for Croatia were being constructed, the specificities of domestic financial markets, economic characteristics of the country and developments on the external financial markets which might have a significant impact on the stability of the domestic financial market were taken into account. The indicators used are shown in Tables 1 and Table 2.

Three methodological approaches were used. The first approach implies the transformation of a certain indicator by means of an empirical cu-

1 For example R. Cardarelli, S. Elekdag and S. Lall: *Financial Stress, Downturns, and Recoveries*, IMF Working paper 100, May 2009.

2 C. S. Hakkio and W. R. Keeton, *Financial Stress: What Is It, How Can It Be Measured, and Why Does It Matter?*, Federal Reserve Bank of Kansas City, Working Paper, 2009.

3 In the context of financial stress identification CDF is commonly considered a function of accumulated loss, and formally it is defined so that for the value x it represents a share of the number of sample observations whose value is less than or equal to x in the total sample. We need to notice that the value of the function is always in the interval $[0, 1]$. For example, the value of 0.95 means that the observed value for that day is greater than or equal to 95% of the historical values recorded up to that moment.

4 The first approach is taken from M. Arinš, N. Sinenko and D. Titarenko: *Latvian Financial Stress Index*, Bank of Latvia, Working paper, January 2012.

mulative distribution function (CDF). This transformation replaces the everyday value of each individual variable with its relative position in the historical distribution of that variable.³ Such transformed values are aggregated in the index of financial stress (IFS1) by simple averaging (Figure 2).⁴

The second approach relies on the extreme value theory, with the purpose of detecting stressed moments for each indicator, which then obtain the value 1. The index of financial stress (IFS2) is constructed as a simple average of the previously calculated individual stress indicators (Figure 1).

Additionally, the third methodological approach is the application of the ECB methodology for the calculation of a composite index of systemic stress⁵. In the context of Croatia, individual indicators transformed by means of CDF are categorised in four segments of financial markets as shown in Table 2. Based on that, sub-indices are calculated for each market as a simple average of individual indicators (as in the first mentioned index version, IFS1). Finally, index of financial stress IFS3 is calculated as the product of individual sub-indices, their correlation matrix⁶ and the weight of each sub-index in the total index ⁷(Figure 1). Analysis of the obtained results shows that despite the selected methodology and the various indicators, the indices equally identify three longer episodes of elevated stress on the domestic financial market which reflect serious disruptions (marked yellow in Table 1).

The most recent period of elevated risks was recorded in the first half of 2011. It is related to the strengthening of the crisis on the public debt market in peripheral countries of the eurozone, which endangered the stability of the banking sector and unfavourably affected business and consumer expectations. The repeated leap in investor's risk aversion, reflected in an increase in risk premiums for Croatia, and to a lesser extent in risk premiums for other European emerging countries, as well as in bonds of the parent banks of the major domestic commercial banks.

The second such episode was marked by a strong growth in global risk aversion under the impact of the global financial crisis and the failure of the American investment bank Lehman Brothers in September 2008, and by price volatility on international financial markets, with market liquidity considerably decreasing. Such developments resulted in a strong leap in the risk premium for Croatia, which taken together made the ac-

5 D. Hollo, M. Kremer and M. Lo Duca: *CISS – A Composite Indicator of Systemic Stress in the Financial System*, ECB, Working Paper 1426, March 2012.

6 Coefficients of a correlation matrix are estimated by the EWMA process in a way that

$$\sigma_{i,j,t} = 0,93\sigma_{i,j,t-1} + 0,07(s_{i,t} - 0,5)(s_{j,t} - 0,5)$$

$$\sigma_{i,t}^2 = 0,93\sigma_{i,t-1}^2 + 0,07(s_{i,t} - 0,5)^2$$

$$\rho_{i,j,t} = \sigma_{i,j,t} / \sigma_{i,t} \sigma_{j,t}$$

where $s_{i,t}$ and $\sigma_{i,t}^2$ represents value and volatility of the sub-index i at the moment t , respectively and $\sigma_{i,j,t}$ represent the adequate covariance between the sub-indices i and j at the same moment.

7 In the case of the eurozone the weights are defined by using the VAR model and reflect the impact of an individual segment of financial markets on industrial production growth. However, as pointed out by Hollo and others in 2012 equal weights have an insignificant impact on index construction. Thus the weights used for Croatia are equal for each segment of the financial markets and amount at 0.25.

Table 2 Indicators used for the calculation of IFS3

Market	Indicators	Transformation
Money	3-month ZIBOR	Absolute daily rate changes
	Interest rate spread – 3-month ZIBOR/3-month French T-bill	Daily values
Bond	EMBI	Absolute daily rate changes
Capital	CROBEX	Absolute daily log returns
	CROBEX	CMAX transformation
	EMBI/CROBEX correlation	Difference between correlation coefficients of 1-month (23 working days) and two-year (552 working days) moving average of CROBEX and EMBI index (log returns)
Foreign exchange	EUR/HRK exchange rate	Absolute daily log returns
	CHF/HRK exchange rate	Absolute daily log returns

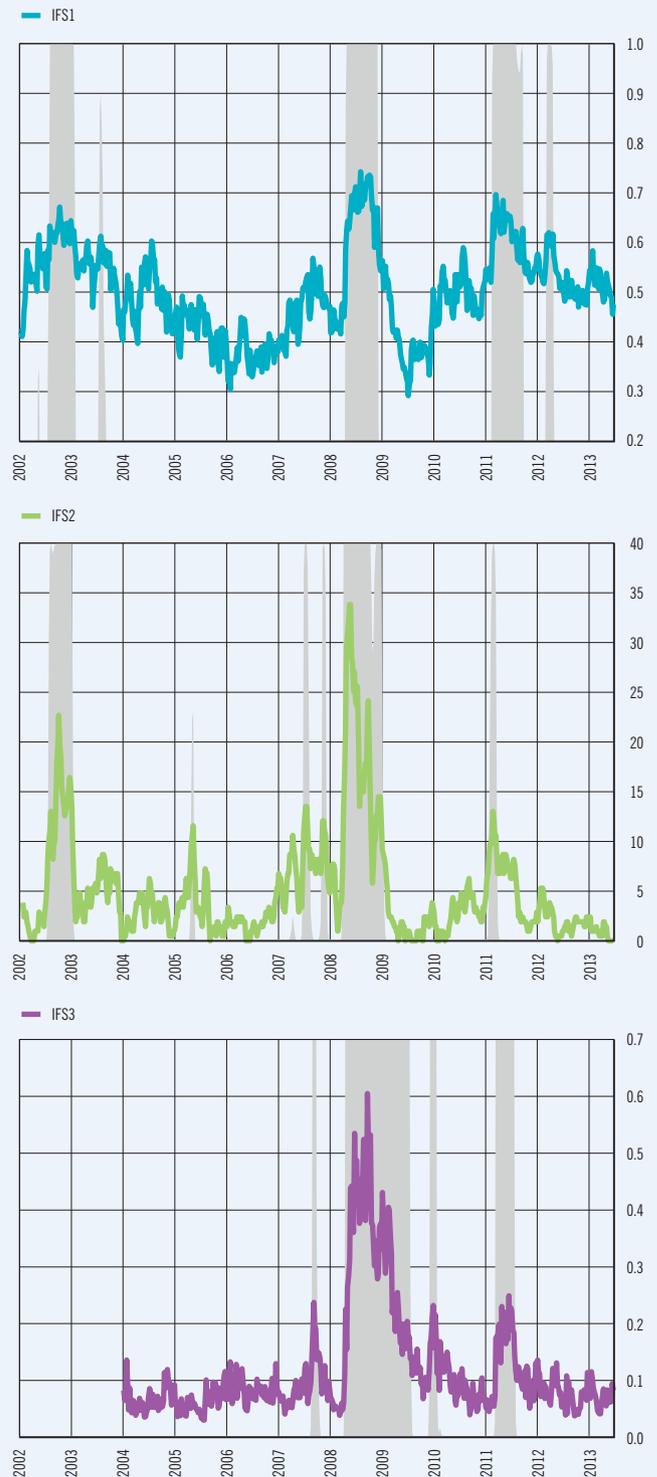
Note: By the CMAX transformation, the value of indicators is at any time equal to the ratio of its value at that point and the maximum value in the last three years (750 working days).
Sources: CNB and Bloomberg.

cess of domestic sectors to foreign capital more difficult. Exchange rate pressures caused the release of foreign liquidity and foreign currency intervention by the CNB meaning that the stabilisation of Kuna partially led to a temporary decrease in kuna liquidity, which was evident from the increased interest rates in the money market. The dynamics of two indices for which there are sufficiently long historical series helps us to observe a period of increased turbulence on the foreign exchange market at the end of 2002 and at the beginning of 2003. For the purpose of maintaining total financial stability due to pronounced pressures on the depreciation of the domestic currency, the central bank was then forced to react by tightening kuna liquidity. This resulted in the maintenance of a stable exchange rate and a high level of international reserves, but also in the largest thus far recorded levels of money market interest rates on placements with shorter maturities.

The last two identified episodes of financial stress greatly contributed to the deterioration of financing conditions of domestic sectors both on the domestic and on the foreign market and greatly hampered and decelerated economic recovery.

It may be concluded that the stress indices described in this box, despite the varying methodological approaches employed, equally warn about the periods of significant increase in stress in the financial sector. With respect to the early available indicators applied in the calculation of certain indices, the regulator has the opportunity to monitor the level and/or the strength of stress in financial markets adequately and accordingly react in a timely way by using a further analysis of the correct sample, using short-term, ad hoc measures (foreign exchange interventions, for example) or long-term, measures like amendments of the macroprudential regulations. However, when interpreting these and similar indices, the variability of connections between financial markets and the remaining part of the economy needs to be taken into account. Thus the process of index construction never ends, it is necessary to revise such indices regularly and promptly in order for them to reflect

Figure 1 Financial stress indices



Note: 1 Indices are shown on a seven-day basis, since the high-frequency data used have inherently greater variability. 2 The two shaded areas show the likelihood that the financial markets will enter a stress regime.
Source: CNB.

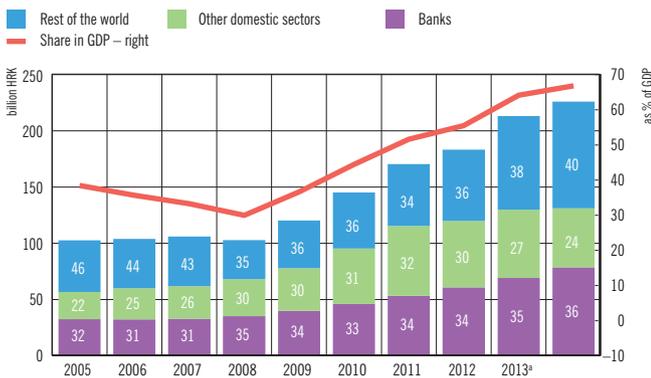
the real structure of the economy and the links between certain markets as realistically as possible.

Finally, additional benefits (in the case of comprehensive indices and robust results) will surely be provided by improvements and analyses

planned in future research, like the inclusion of “low” frequency indicators (for example ten-day data from the banks’ balance sheets), application of the SWARCH model for identifying stressful episodes common to all indices, forecast of stress levels in the forthcoming period and construction of an early warning system for stress.

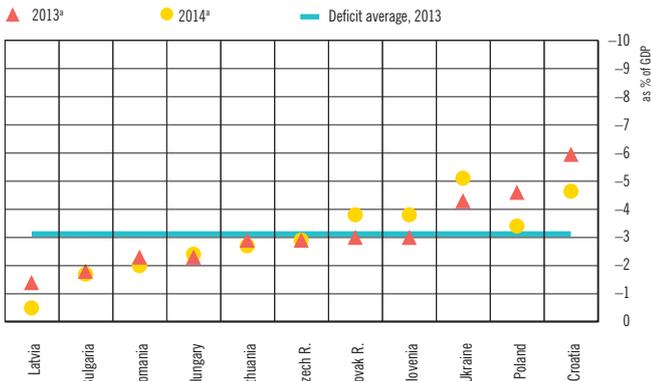
Government sector

Figure 28 General government debt



* CNB projections.
Sources: MoF and CNB.

Figure 29 General government deficit



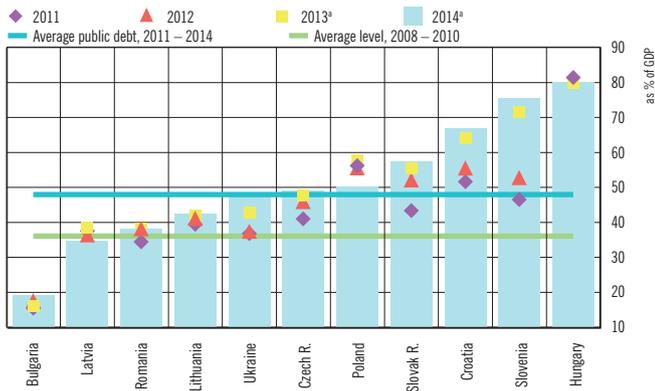
* CNB and IMF projections.
Source: Eurostat.

Manoeuvring room for fiscal policy is limited due to the risks arising from high public debt and budget deficit. After Croatia enters the excessive deficit procedure, the proposed budget for 2014 and plans for 2015 – 2016 will need to be adjusted to the requirements of the European Commission in order to decrease the budget deficit and in order to stop the growth in public debt, which in 2013 exceeded the level of 60% of GDP. This process will have a dual effect on financial stability. On the one hand, fiscal consolidation will have a positive impact on financial stability by decreasing the need for financing and by implementing structural reforms. On the other hand, a negative contribution of the government to GDP growth may endanger the expected economic growth in 2014 if the predicted growth in investments and exports fails to materialise.

Fiscal policy is at a turning point because as of end-January the new EU excessive deficit procedure is being implemented. This procedure decreases the autonomy in managing fiscal policy, but at the same time it has a dual effect on financial stability. In the middle term its effect is positive because by decreasing general government deficit and the share of public debt in GDP it ensures debt sustainability, but in the short term it may have a negative impact because it decreases public consumption which then has a negative impact on GDP.

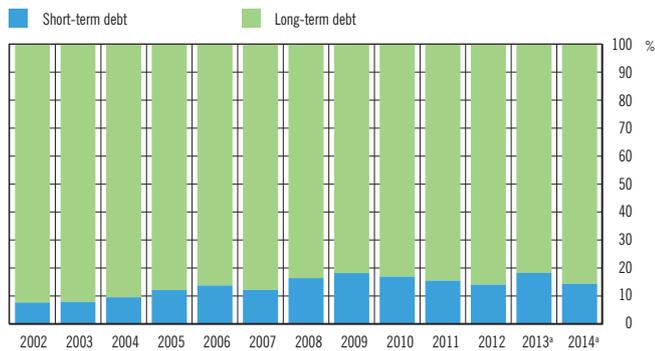
The depth and the length of the recession caused by the financial crisis, as well as the absence of a major fiscal consolidation

Figure 30 Public debt



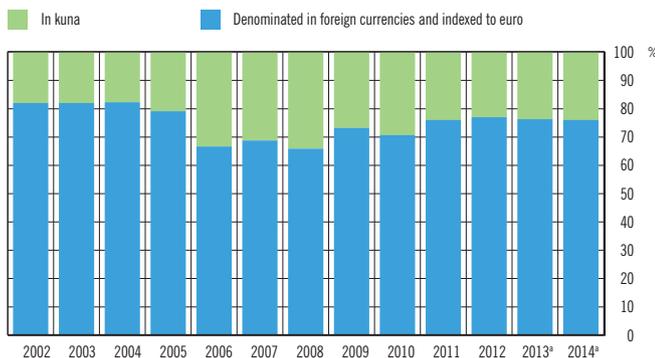
* CNB and IMF projections.
Source: Eurostat.

Figure 31 Breakdown of public debt by remaining maturity



* CNB projections.
Sources: MoF and CNB.

Figure 32 Currency breakdown of public debt



* CNB projections.
Sources: MoF and CNB.

Table 5 Thresholds of the fiscal sustainability risk indicator in 2013^a

Indicator	Direction to be safe	Threshold	Observation for Croatia	Observation for Croatia
$r - g^b$	<	1.1%	4.9%	↑
General government public debt (as % of GDP)	<	42.8%	64.2%	↑
Cyclically adjusted primary balance (as % of potential GDP)	>	-0.5%	-2.8%	↓
Gross financing needs (as % of GDP)	<	20.6%	13.1%	↑
Share of short-term debt as a ratio of total debt	<	44.0%	18.3%	↓
Debt denominated in foreign currencies	<	40.3%	76.3%	↓
Weighted average maturity of public debt (years)	>	2.3	5.3	↓
Short-term external public debt (as % of international reserves)	<	61.8%	2.4%	↑

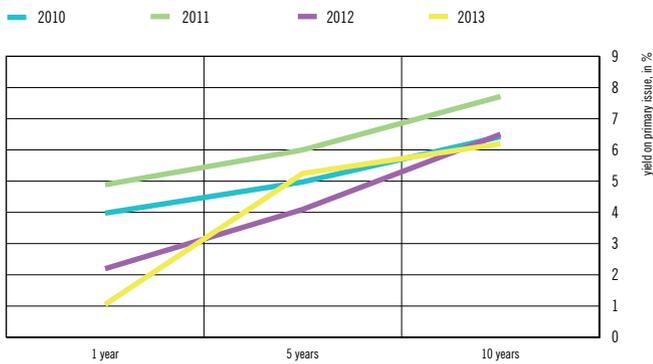
^a Baldacci, E., I. Petrova, N. Belhocine, G. Dobrescu and S. Mazraani: *Assessing Fiscal Stress*, IMF Working Paper, WP/11/100.

^b Imputed interest rate on general government debt, deflated by the GDP deflator (5-year average), minus real GDP growth rate (5-year average). Sources: IMF WP/11/100 and CNB.

in the form of a decrease in expenditure, resulted in a considerable deterioration of public finance from 2009. A negative impact came from other aspects of fiscal policy as well, like the assumption of the shipyards' debts, health institutions' debts and the debts of other government enterprises. After a certain consolidation of public finance in 2012 on the basis of a decreased expenditure and deficit, general government deficit and expenditure increased again in 2013, and public debt exceeded the level of 60% of GDP. This is the consequence of fiscal policy measures on the income and expenditure side of the budget, such as the payment of debts in the health sector, changes in corporate taxation and changes of circumstances in collecting indirect taxes (VAT) after the accession of Croatia to the EU. Fiscal balance of the general government budget in accordance with ESA 95 is estimated at the level of around -5.9% of GDP in 2013 (-5% of GDP in 2012), while the structural balance of the general government budget is at the level of -4.6% of GDP (-3.9% of GDP in 2012).

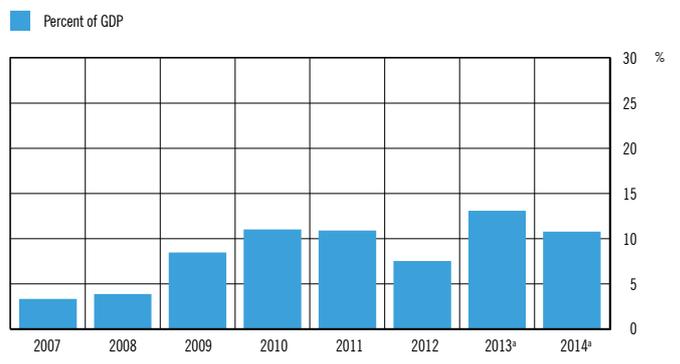
The proposed budget for 2014 and for the two subsequent years (2015 – 2016) implies that the planned deficit in those years, which is greater than 3% of GDP, is not temporary. It is thus considered that the Stability and Growth Pact precondition of a budgetary deficit of 3% of GDP is not being met. In comparison with selected countries Croatia had by far the greatest deficit in 2013, which confirms the need for a credible fiscal policy. Due to the continuously present deficit caused by the recession and the assumption of shipyards' debts, at the end of 2013 public debt was greater than 60% of GDP. A sudden increase of public debt is related to the snowball effect due to the high growth rate of interest on public debt in relation to eco-

Figure 33 Yield on primary issue of euro securities



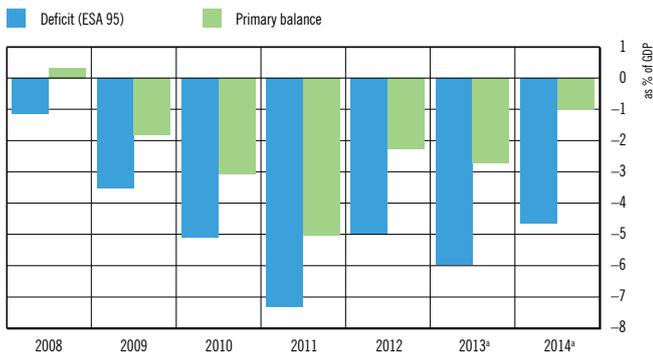
Source: MoF.

Figure 36 Gross financing needs



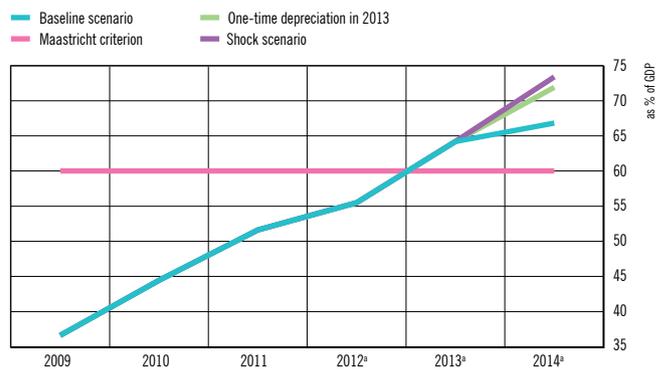
* CNB projections.
Sources: MoF and CNB.

Figure 34 Projection of general government deficit



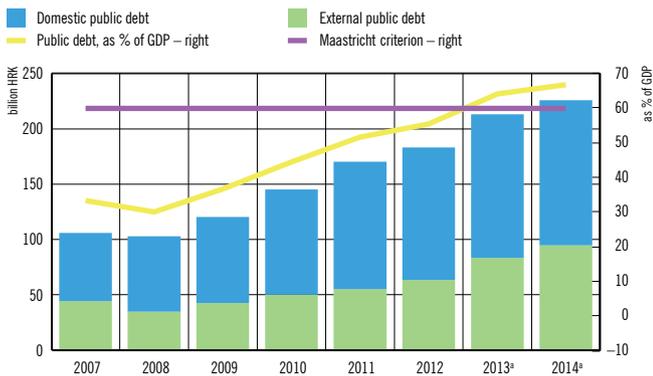
* CNB projections.
Sources: MoF and CNB.

Figure 37 Projection of public debt under various scenarios



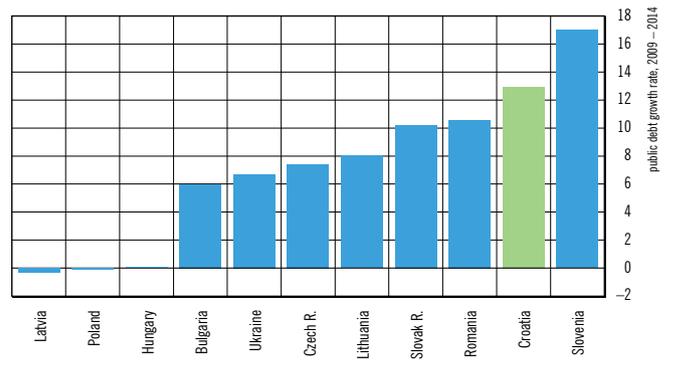
* CNB projections.
Source: CNB.

Figure 35 Projection of general government debt



* CNB projections.
Sources: MoF and CNB.

Figure 38 Public debt growth rate (2009 – 2014)



Sources: Eurostat and CNB.

conomic growth. Among comparable countries Croatia has one of the greatest levels of public debt, behind Slovenia and Hungary, with a worrying speed of public debt growth of around 13% annually on average.

Public debt growth as a consequence of the ongoing recession is not specific to Croatia alone. This is confirmed by the average movement of public debt levels in selected countries for the period between 2008 and 2010 in which the average public debt stood at 36.1% of GDP, and for the period from 2011 to 2014 the average public debt reached 47.9% of GDP, which is an increase of 11.8 percentage points.

According to the budget for 2014 the total needs for general government financing amount to around 10.8% of GDP, 2.3 percentage points less than in 2013 (part of the financing needs for this year was satisfied in 2013). Those needs will additionally decrease through budget revision in line with the requirements of the excessive deficit procedure. Financing needs for 2014 have partially already been satisfied through the sale of bonds in the American market in 2013 in the amount of \$1.75bn, with yield to maturity of 6.2%. The increase in yield in relation to previous borrowing shows the assessment of the market that the riskiness of public finance has increased, which implies an additional burden on the budget with regard to future repay-

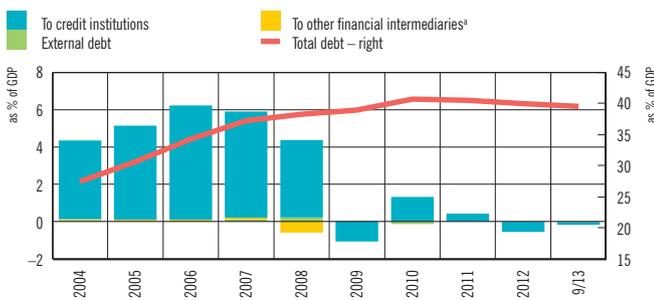
ments. Interest on borrowings up to one year is still under the impact of the CNB policy of increased liquidity and thus the country's appetite for short-term borrowing is stronger.

Indicators of fiscal sustainability risk did not change considerably in relation to mid-2013, even though some indicators show a mild deterioration. Primarily this refers to the increase in the public debt to GDP ratio and the cyclically adjusted primary balance and implicit interest rate on public debt decreased by the growth rate of real GDP ($r - g$), which indicates the need for public finance consolidation. Four indicators are in the 'safe' area, but they are also slowly deteriorating. The weighted average public debt maturity is declining, and the ratio of short-term debt to all public debt is increasing, due to the increasing use of short-term financing sources such as T-bills.

Under the stress testing shock scenario public debt increased above 70% of GDP. The shock-scenario which includes, alongside a drop of GDP by around 1.2%, a one-off depreciation of the kuna/euro exchange rate by 10%, results in a growth in public debt in 2014 to the level of 73.4% of GDP. This would increase the risk of a fall in the credit rating with a negative effect on the country's financial stability. Due to the one-off depreciation of the exchange rate of 10%, public debt would increase to the level of 71.9% since more than 70% of public debt is in a foreign currency or indexed to a foreign currency.

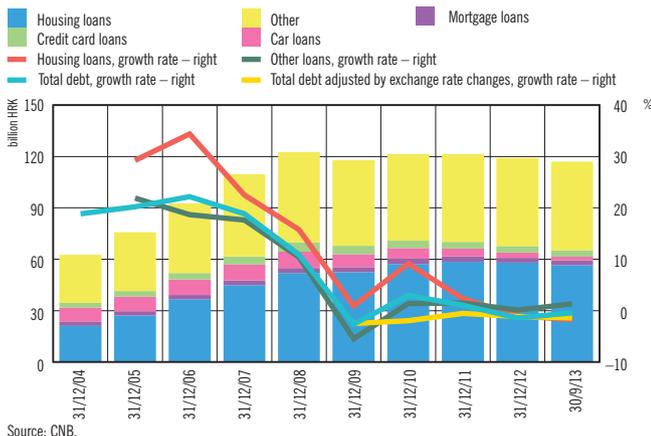
Household sector

Figure 39 Change in and stock of household debt



^a Data on household debt to insurance companies are based on estimates.
 Note: Data on total household debt exclude debt to leasing companies in order to avoid a break in the data series caused by the change in the methodology for reporting the value of leasing contracts from 1 January 2011 onwards. Due to the harmonisation of the sector classification with the European System of National Accounts (ESA 95), household debt to banks, savings banks and housing savings banks is reported as debt to credit institutions.
 Sources: HANFA and CNB.

Figure 40 Household loans by purpose



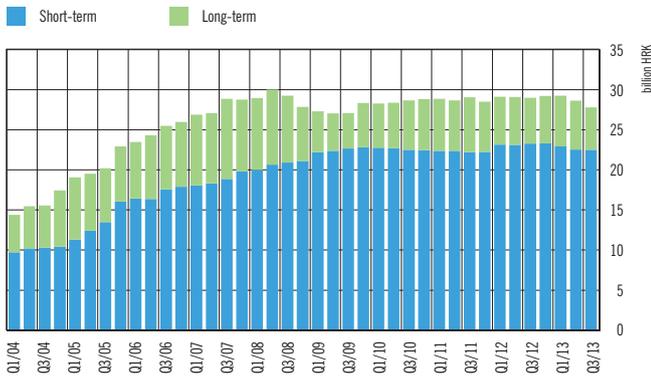
Source: CNB.

Household deleveraging continued in 2013, and in view of the expected, weak economic recovery, high structural unemployment and low optimism level, this trend is likely to continue in 2014. Although the regulation-reduced interest burden will in the short-term make it easier for some households to repay their loans, due to the increased exposure to interest rate changes in the middle term, the vulnerability of this sector has increased additionally.

In 2013 households continued to decrease their financial liabilities to all creditors in conditions of years-long absence of economic growth, high unemployment and overall uncertainty (Figure 39). During a one-year period households decreased most their debt to credit institutions, which in 2013 accounted for almost 99% of the total financing of this sector. The annual rate of change of total household debt at the end of the third quarter of 2013 was relatively low and amounted to -0.43% , which is a consequence of the usual seasonal weakening of the kuna exchange rate, and so the rate of decline in debt adjusted by the change in exchange rate was almost three times greater, -1.41% (Figure 40).

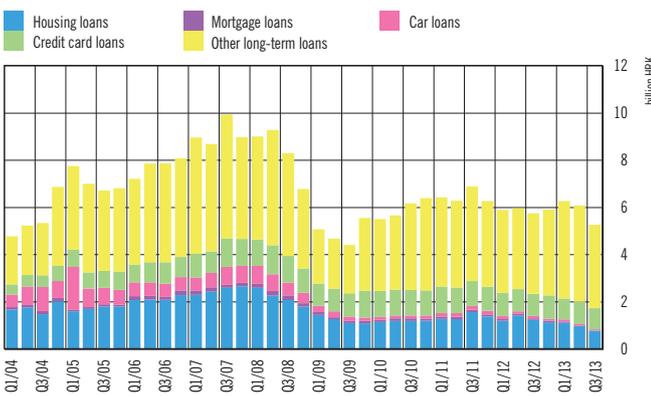
Households decreased their debt in terms of all types of bank loan (Figure 40). The somewhat lower amounts of newly-granted loans contributed to this significantly, especially in the third quarter of 2013, when households were granted the lowest amount of new loans in the last four years (Figure 41). The decrease in new household borrowing was more pronounced in long-term than in short-term bank loans, so a slight rise of those loans recorded in the first half of 2013 was offset.

Figure 41 Maturity breakdown of newly-granted household loans, adjusted by seasonal fluctuations



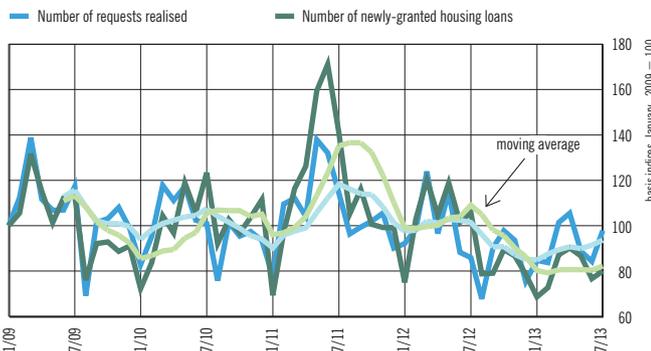
Source: CNB.

Figure 42 Newly-granted long-term household loans by purpose, adjusted by seasonal fluctuations



Source: CNB.

Figure 43 Number of credit standing assessments requested from the Croatian Registry of Credit Obligation base and the number of newly-granted housing loans



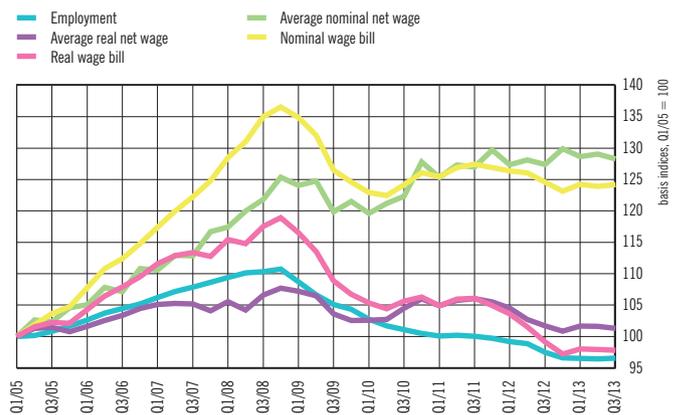
Source: Croatian Registry of Credit Obligations.

Figure 44 Change in household lending criteria in the last three months



Note: Positive and negative values denote the strengthening and weakening of credit standards, respectively. Source: CNB.

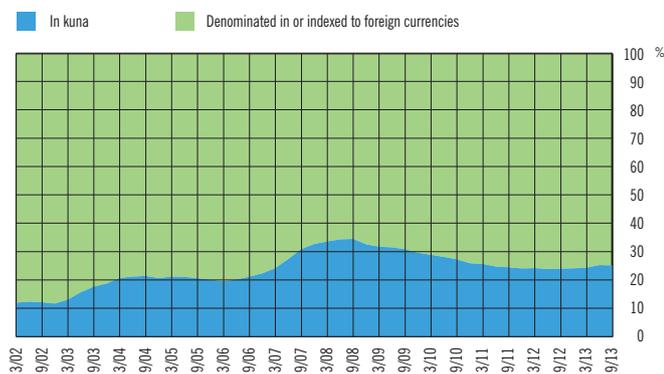
Figure 45 Employment and wages (seasonally adjusted)



Source: CBS.

In the structure of new long-term borrowings, the amounts of newly-granted housing loans decreased the most (by -37.5% at the end of September, Figures 42 and 43), which, alongside the increasing deterioration of their quality, was reflected in the increasing decline in the total amount of housing loans granted to households (at the annual level by -2.5% in effective terms). At the same time the amounts of all other types of long-term loans decreased (especially car loans, the already newly-granted amounts of which have been more than halved in the last year and a half). By the end of September 2013 only amounts of newly-granted other long-term loans continued to increase (e.g. cash any-purpose loans, overdrafts etc.) despite a strong tightening of conditions for their approval (Figure 44), which affected the rise of the total amount of other loans at annual level by 1.3% (Figure 40).

Figure 46 Currency breakdown of household loans



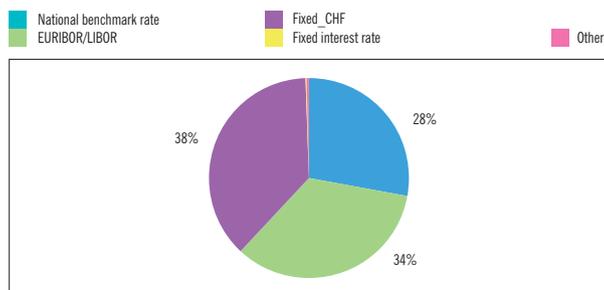
Source: CNB.

Figure 47 Household loans by interest rate variability



Source: CNB.

Figure 48 Estimated banking system structure with respect to the type of the changing parameter used in defining the interest rate on housing loans



Note. The estimation of the banking system structure is based on the changing parameter used in defining the interest rate, published on the web-sites of individual banks, and the share of banks in total amount of newly-granted loans at the end of September 2013.

Source: Banks' web-sites and CNB.

Extremely weak lending activity in the household financing segment is a consequence of a combined impact of low consumer optimism (Figure 2) and tightened lending conditions (price conditions, but also collateral requirements, Figure 44), which discouraged household demand, low already because of the high unemployment and the still declining real income (Figure 45). Household interest in new loans is not likely to increase considerably in the following period; household demand will be able to trigger a new wave of lending only after a considerable slowdown in the negative trends in the labour market that might bolster consumer confidence and thus also personal consumption and investments, especially if residential property continues to be increasingly financially available (Figure 56).

Besides macroeconomic risks in the form of loss of jobs, in 2013 households were especially exposed to the possibility of loan repayments increasing, due to exchange rate changes and/or interest rate changes (Figures 46 and 47). At the end of September 2013 the household exposure to currency risk slightly declined (share of loans indexed to a foreign currency accounted for 75% in the total loan structure), while the exposure to interest rate risk continued to increase (almost 99% of all loans were granted with the possibility of interest rate change within one year), partially under the influence of the structure of newly-granted long-term loans.

The amendments to the Consumer Credit Act, which regulate the method of interest rate calculation in household loans so that a fixed margin² is added to the selected variable parameter, could have certain positive effects on household financing conditions and their interest cost burden. Besides implementing a completely clear definition of interest rates and the conditions under which they can be modified, the most significant amendment brought forward by this regulation is the limitation of interest rates in currency-indexed housing loans, in conditions of considerable³ appreciation of the relevant exchange rate.⁴ Those amendments aim at alleviating the possible combined negative impacts of exchange rate and interest rate exposures of households, which in the case of loans indexed to the Swiss franc proved to have a very negative effect on household creditworthiness. The temporary limitation of those interest rates, which makes them actually fixed, will reduce the interest burden to households burdened by those loans, the repayment of which will be facilitated.

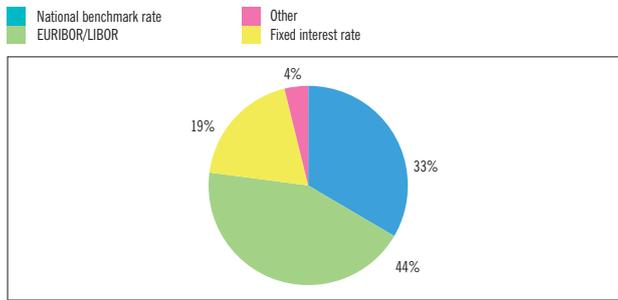
Alongside desired, positive, effects the amended regulation also leads, especially in the long-term, to certain risks that should not be neglected. These risks are primarily the consequence of the possibility of relating the interest rate changes to the dy-

2 The national reference rate of the average banking sector financing cost, EURIBOR, LIBOR, yield on T-bills of the MoF or the average interest rate on household deposits in the underlying currency.

3 More than 20%

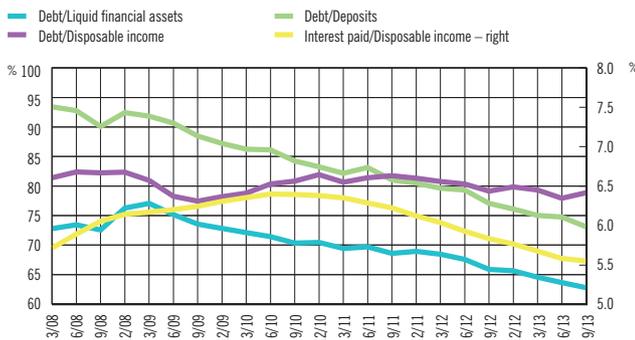
4 See the CNB Bulletin, No. 196, October 2013, Box 1 Note on the expected effects of the proposed Act on Amendments to the Consumer Credit Act

Figure 49 Estimated banking system structure with respect to the type of the changing parameter used in defining the interest rate on other household loans



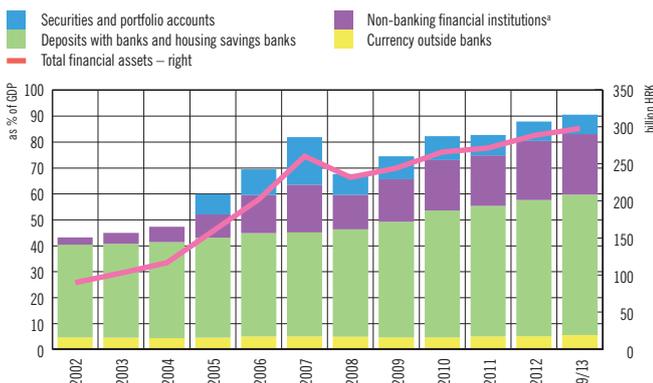
Note: The estimation of the banking system structure is based on the changing parameter used in defining the interest rate, published on the web-sites of individual banks, and the share of banks in total amount of newly-granted loans at the end of September 2013.
Source: Banks' web-sites and CNB.

Figure 50 Household debt and debt burden



Note: Data on total household debt exclude debt to leasing companies in order to avoid a break in the data series caused by the change in the methodology for reporting the value of leasing contracts from 1 January 2011 onwards.

Figure 51 Household financial assets



* Data on household claims against open-end and closed-end investment funds and data on claims against insurance companies are based on estimates.
Sources: HANFA, CDCC and CNB.

namics of the still extremely low EURIBOR/LIBOR, which fails to reflect the bank financing costs adequately: in conditions of monetary expansion in the eurozone and the consequent historically low interest rates, it is much more likely that the related variable interest rates of banks will rise than that they will decline. In the middle-term thus, with the tightening of monetary policy and the likely growth in the general interest rate level, the commitment of banks (Figures 48 and 49) to the application of EURIBOR/LIBOR as a variable parameter could have a destabilising impact and endanger the continuity of household loan repayment. With respect to the altered consumer habits of households and the recent experience with risks arising from loans indexed to a foreign currency made with a variable interest rate, the mentioned financing modalities could additionally decrease household demand for new loans, and thus household consumption as well.

The continuing household deleveraging in the second and the third quarter of 2013 brought about an improvement in the majority of indicators of this sector's debt and debt burden (Figure 50), and a further improvement of those indicators is expected due to the amendments to the Consumer Credit Act. As well as reducing their debts, in the observed period households continued to increase their savings in banks and housing savings banks (by an annual average of 4.1%), which considerably contributed to the rise in their overall liquid financial assets⁵ (Figure 51), so the ratio of debt to these household savings categories, which had been declining for years, additionally improved by the end of September 2013. The gradual slowdown in the growth in nominal household disposable income,⁶ which started at the end of 2011, primarily under the impact of rising unemployment, reversed to a drop in the third quarter of 2013, and thus the ratio of debt to household disposable income slightly increased at the end of September. At the same time the coverage of the currently declining amount of interest paid by disposable income slightly improved, and further decrease in the interest paid burden may be expected in 2014 as well, in view of the interest rate limitations embodied in the Consumer Credit Act.⁷

The halting of the contraction of economic activity expected in 2014 probably will not be a sufficiently strong incentive for the recovery of undermined household optimism. Together with the further decline in real income and the obvious change in consumers' habits, caused by the years-long recession that decreased their real assets, this will be a major hurdle in strengthening this sector's demand for new, especially long-term, loans. The deleveraging process will likely continue, even though a

5 Household financial assets exclude foreign cash and deposits with foreign banks since their level cannot be precisely estimated.

6 Estimated disposable income of households does not include some forms of income generated in the official economy (e.g. royalties, temporary service contracts and income from capital) or income from the unofficial economy (grey economy).

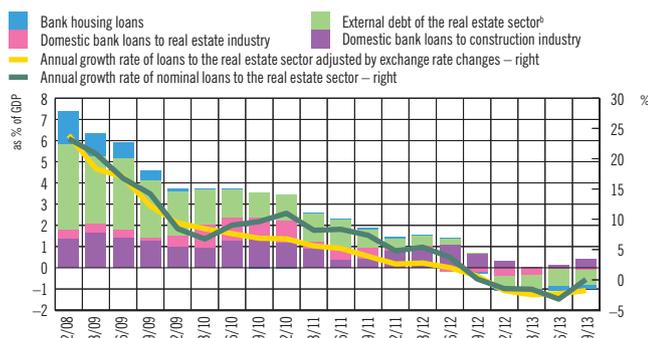
7 It is estimated that the indicator of the interest paid burden may improve by around 7.5%.

slight deceleration is possible. Despite that, the potential future bank losses which could arise from lending to this sector have increased, primarily due to a greater exposure of households to

interest rate risk, which could, if the global interest rate level rises, considerably hamper the repayment of the majority of both existing and new loans extended to households.

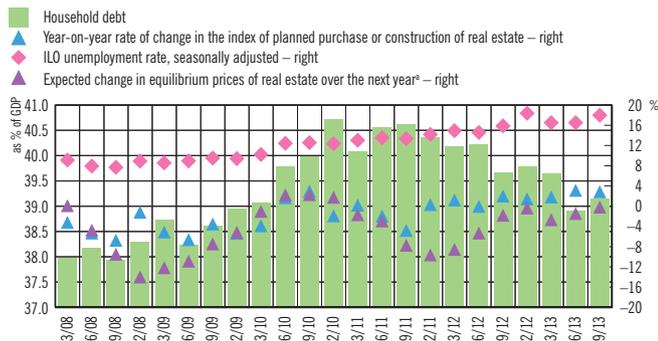
Real estate sector

Figure 52 Annual change^a of the real estate sector debt



^a Changes in debt adjusted by exchange rate changes.
^b External debt includes the debt of real estate and construction industries.
 Note: The figures relating to domestic loans granted to the real estate sector before 2010 were slightly modified due to the new classification of activities.
 Source: CNB calculations.

Figure 53 Household debt, unemployment rate, consumer optimism and real estate market expectations



^a Refers to the expected annual change in the same period of the next year (+ 12 months) and is estimated based on the equilibrium price model, taking into account CNB projections for the main determinants of demand for residential real estate (real interest rates and household disposable income).
 Source: CNB.

The real estate sector decreased its debt in 2013. Despite a better financial availability of residential properties, a further deleveraging of this sector is likely also in 2014 with regard to the expected absence of positive stimuli from the labour market capable of reviving the residential real estate market.

Though slightly decelerated, the real estate sector deleveraging process, which started at the end of 2012, continued in the first three quarters of 2013 (Figure 52). By the end of September the effective debt (excluding the impact of exchange rate decrease) additionally decreased by 1.8% at annual level, even though its nominal amount held steady. The greatest contribution to the deleveraging of the real estate sector came from the decline in external debt (by -0.8% of GDP on average in the observed period), while the decrease in domestic lending to corporations dealing with real estate and in housing loans was somewhat weaker (in average annual amount of -0.2% and -0.1% of GDP respectively).

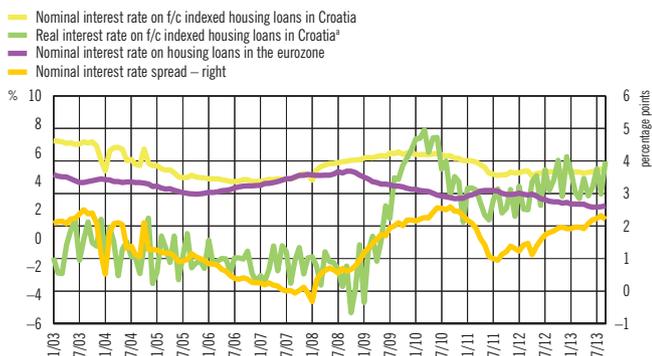
In the debt growth structure of the real estate sector only corporates dealing in construction continued to slightly increase domestic loans (average annual debt growth of those corporates amounted tot 0.3% of GDP, as at the end of 2012). However, that growth entirely arose from borrowing by the public sector corporations, which have not lost the financial support from banks since the beginning of the crisis, while for the fourth consecutive quarter private construction companies record a decrease in their liabilities to the domestic banking sector (by -0.4% of GDP on average). A more intensive deleveraging of corporates dealing in construction may be expected in the forthcoming period, with regard to the deepening of nega-

Figure 54 Housing loans and HREPI^a on a quarterly basis



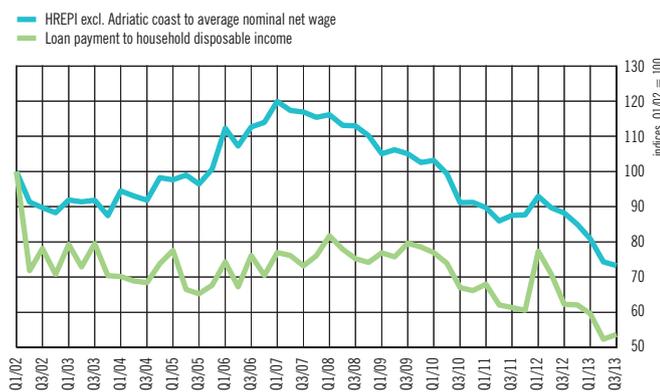
^a The hedonic real estate price index takes into account qualitative characteristics of the real estate. Source: CNB calculations.

Figure 55 Comparison of interest rates on newly-granted housing loans in Croatia and the eurozone



^a The real interest rate on f/c indexed housing loans was deflated by the change in the average nominal net wage, excluding the effect of the crisis tax. Sources: ECB and CNB.

Figure 56 Financial availability of residential property



Sources: CBS and CNB calculations.

tive cyclical developments in the residential real estate market (Figure 54) and the so far recorded trends in the process of pre-bankruptcy settlements, in which the share of corporates from this sector is above average (see Box 3 Resolving non-performing loans of banks in Croatia).

Maintaining unfavourable labour market conditions in 2013 affected the relative increase in the interest burden in housing loans (Figure 55). Such trends, alongside a strong tightening of other lending standards of banks (Figure 43) and the still relatively low level of consumer and investment household optimism (Figure 53), brought about the increasing decline in demand for residential property, and thus also a drop in the prices of residential property (Figure 54). At the end of the third quarter of 2013 the prices of residential properties in Croatia measured by the hedonic real estate price index (HREPI) had decreased by almost 17% at annual level (Figure 54)⁸ and returned to the end-2004 level. Such a strong annual price correction was largely, among other things, a consequence of the residential property price growth during the first half of 2012 (5% at annual level) caused by a pronounced segmentation of the real estate market (i.e. purchase of mostly higher quality real estate in attractive locations). The decrease in prices is also evident from market indices of the asking prices for real estate,⁹ although the decline in those indices in the observed period is considerably lower. Due to the accelerated price drop in conditions of almost unchanged nominal net wages and a slight decline in disposable household income, the financial availability of residential properties improved in comparison with end-2012. In line with that the indicators of financial availability of residential property reached in mid-2013 their lowest level in the last ten years (Figure 56).

Despite the improved financial availability and the announcements that certain incentive measures will be introduced focusing mostly on the rental segment, no revival of the residential real estate market is likely in the forthcoming period. Namely, the undermined consumer optimism, the still high risk of losing jobs and the existing risks of exchange rate and interest rate changes continue to dissuade households from borrowing for the purpose of purchasing housing units. The halting of these trends will thus depend mostly on labour market developments (employment and disposable income) which are the main determinants of the dynamics of real estate prices (see Box 2 Real estate prices model).

⁸ Such a strong decline in HREPI may be partly explained by a small number of purchased or sold real estate and possibly by a weaker quality of input data, which led to a distortion in the representativeness of the sample, which could not be corrected by the hedonic method.

⁹ Real estate asking price index, *CentarNekretnina*.

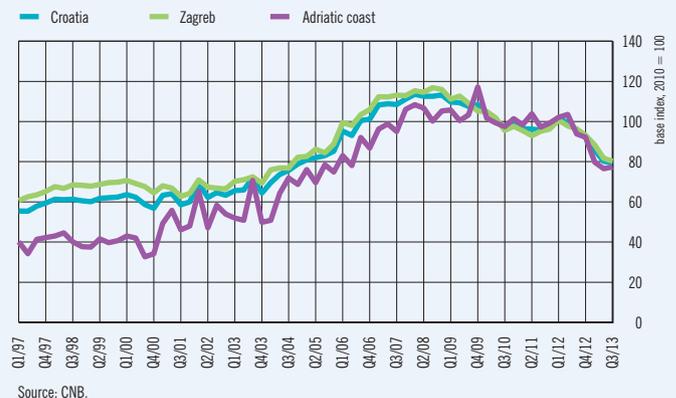
Box 2 Real estate price model

Price bubbles on the real estate market, i.e. deviations of those prices from their stable levels may be a serious threat to financial system stability, especially in conditions of a high share of housing loans in total loans and in conditions of poor coverage of risks related to real estate market development with capital.¹ The most recent global financial crisis pointed to a need for and the importance of identification of periods in which real estate prices deviate considerably from the movements of their basic determinants. Namely, the eased lending standards for housing loans in the USA in the first half of the last decade stimulated demand for real estate and intensive growth in the value of properties. A strong expansion of loans to the private sector led to the creation of a price bubble on the real estate market, and the deflation of this bubble was one of the triggers of the great global economic crisis. A similar situation happened in some EU countries (such as Ireland, Spain and Great Britain), but also in Croatia, where the prices of residential properties for more than a decade to a great extent characterised both the period and the intensity of the credit cycle. In order to limit similar credit expansions on the real estate market in the future, which empirically proved to be a significant risk for financial stability and the real economy, the new European regulatory framework² has implemented or plans to implement numerous regulatory requirements the aim of which is precisely to identify and limit risks in the real estate sector and by doing so prevent their possible spillover to the entire economy.

Considering the importance and the impact of the real estate sector on the economy as a whole and considering the fact that deviation of the real estate price dynamics from the movement of their basic determinants considerably increases the probability of their future correction, which may have numerous negative consequences, it is extremely important to determine the relation between the current market and equilibrating price level³. Thus the purpose of this research is to determine whether market prices of residential properties in Croatia deviate from their equilibrating price by an assessment of an econometric model which combines the impacts of both demand and supply on price level.

The trends in residential property prices are mostly monitored by means of various indices which may be constructed based on asked or achieved prices on the market. The various methods aim at isolating the real price dynamics from those indices, "cleared" from consumer preferences that are changeable in time and from the quality of the residential area. The hedonic price method, the repeat sales method and the hybrid method are used most commonly. The prices of residential properties in Croatia are measured with the hedonic real estate price index⁴ (HREPI) (Figure 1), which shows the trends in prices excluding the impact of qualitative characteristics of real estates. It needs to be borne in mind that real properties are extremely heterogeneous and that

Figure 1 The hedonic real estate price index for Croatia, Zagreb and the Adriatic coast



they are relatively rarely traded, which additionally hinders the precise monitoring of their prices.

By the beginning of 2002 the prices of residential properties in Croatia were relatively stable. However, together with the strong economic and credit growth⁵ began a period of real estate sector expansion, and so the growth of residential property prices that had been slow up to that moment, strongly accelerated (by around 11% annually on average). In the beginning of 2008 the prices of residential properties reached their historical high. However, with the outbreak of the global financial crisis and its spillover onto the domestic economy, household credit demand decreased considerably. This in turn brought about a fall in demand for residential properties and as a consequence a drop in prices on the housing market, and a strong contraction of real estate sector activities⁶. By the end of September 2013 the prices of residential properties had decreased by 30% in relation to the beginning of 2008, and they are now at the lowest level since 2004 (Figure 1).

Relatively simple methods by which periods of real estate price deviations from their equilibrating level may be approximately identified (periods of overvaluation or undervaluation) and which are commonly used in literature and in practice, are the ratio of real estate price to income (P-I) and the ratio of real estate price to rent (P-R). Deviations of these ratios from their long-term average are taken as indicators of overvaluation, or undervaluation of market prices.⁷ However, this approach leads to a major limitation in the employment of these indicators, since the long-term averages of ratios which are taken as reference value con-

1 At the end of the third quarter of 2013 that share in Croatia was 48%.

2 See Box 5 Monitoring systemic risk and shaping macroprudential policy

3 It is the case of price dynamics which balances demand and supply on a certain market, based on their long-term relation.

4 D. Kunovac, E. Dožović, G. Lukinić, A. Pufnik, *Use of the Hedonic Method to Calculate an Index of Real Estate Prices in Croatia*, CNB Working Papers, I-20, 2008.

5 The average annual GDP growth between 2002 and 2007 was 4.8%, real net wages in the same period rose at an average rate of 2.8%, and at the end of 2007 the unemployment rate decreased in relation to end-2002 by one third.

6 The share of gross added value produced in the construction sector and in real estate activities in total gross added value at the end of the third quarter of 2013 was 15% in comparison to end-2007 when this share stood at almost 20%. The number of building permits issued halved in the same period.

7 OECD, Economic Outlook No. 78, Chapter III, Recent House Price Developments: The Role of Fundamentals, pp. 123-154, 2005.

siderably depend on the length of the period for which the analysis is conducted. Despite that, those indicators, besides being used as measures of the financial availability of real estate, may be used as control techniques for verifying the robustness of the significantly more complex econometric models used in this research. Since there is limited availability of data on rental figures in Croatia (in the form of frequency, scope and reliability), further in this study the P-I indicator was used to verify the robustness of the assessed econometric model⁸.

In the observed period (2000-2013) the ratio of residential property prices to disposable household income in Croatia was similar to that of other European countries (Figure 2). From the beginning of 2002 to the end of 2004 the P-I indicator was below the long-term average level, which indicates that the prices of residential properties in that period might have been undervalued. However, during the second half of the last decade the P-I indicator was mostly above its long-term average. With the outbreak of the financial crisis this indicator started to decrease in all observed countries, so by the end of September 2013 in Croatia it again fell below its long-term average. Clearly, this interpretation needs to be taken very carefully due to the mentioned limitation in the sense of the short period for which the analysis was conducted.

Using the P-I indicator may give an insight into the long-term trends and help in assessing the potential undervaluation or overvaluation of real estate prices, but it does not suggest their determinants. In order to better understand price trends in the real estate market in Croatia, a model⁹ was developed that will help to provide a better insight into the basic determinants of residential property price developments.

For that purpose the error correction model for residential real estate prices was assessed¹⁰. In contrast with the given P-I indicator which treats the deviation from the long-term average as a possible overvaluation or undervaluation in relation to long-term developments, the result of the error correction model is deviations of market prices from the equilibrating level implied by the interaction of variables included in the model. The assessed model contains variables of supply and demand constructed using the principal component¹¹ analysis and real interest rate on housing loans indexed to foreign currency and consumer confi-

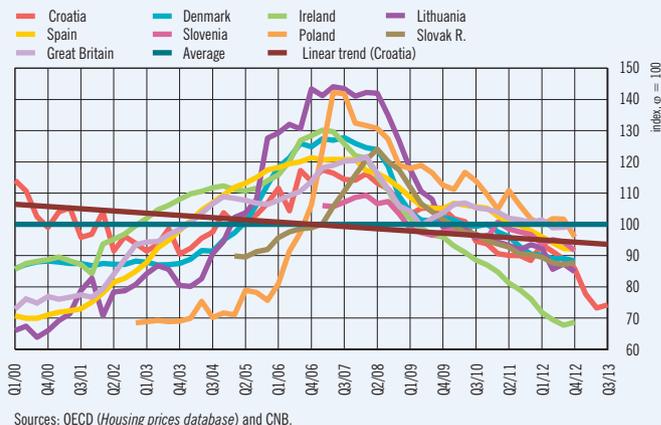
8 The assessed amount of rent may be constructed indirectly by means of the "user cost" methodology (for more details see P. Hilbers, A. W. Hoffmaister, A. Banerjee, H. Shi: *House price developments in Europe: a comparison*, IMF Working Paper, 08/211), which will be one of the guidelines for further development of monitoring real estate market trends in Croatia.

9 Actually, this is an improvement of the existing model which was described in detail in Financial Stability No. 2 published in February 2009. Including variables on the supply side and using a great number of variables with the aim of better describing determinants of the real estate prices are the major changes in relation to the model which was assessed earlier.

10 Prior to the assessment of the model, the conditions which the variables need to satisfy in order for the model to be valid were verified: stationarity of variables in the first differences and cointegration relationship between variables which is tested by using the Johansen procedure.

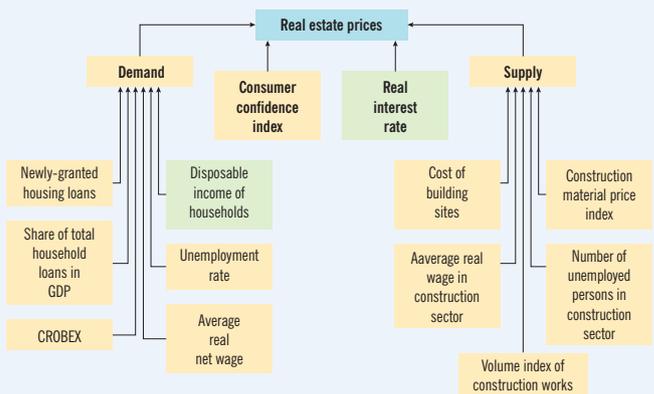
11 The principal component analysis reduced a greater number of possibly correlated variables to a smaller number of non-correlated variables (linear combinations of initial variables) which are called principal components.

Figure 2 Comparison of P-I indicators for Croatia and selected European countries



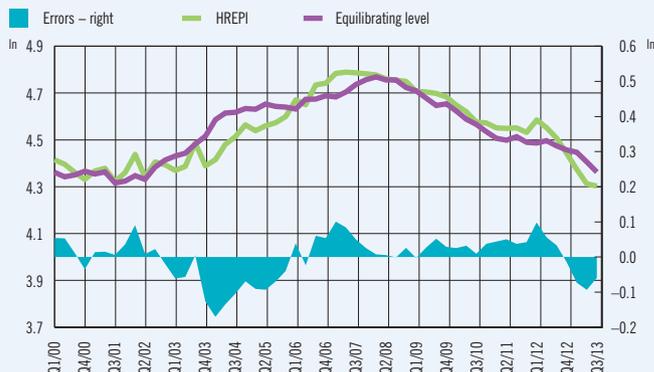
Sources: OECD (Housing prices database) and CNB.

Figure 3 Schematic overview of real estate prices model



Note: Variables used for the estimation of real estate prices in the existing model are marked by green colour. Source: CNB.

Figure 4 Overview of HREPI and estimated equilibrating levels of real estate prices



Source: CNB.

Table 1 Results of estimated models

Independent variable	Coefficient
Real interest rate*	-0.90
Demand***	0.31
Supply (-4)***	0.39
Ln (consumer confidence index (-1))	-0.03
Constant***	4.44
R ²	0.84

Note: Symbols * and *** indicate the significance of variables at the 10% and 1% levels.

Source: CNB.

dence index¹². The dependent variable in the model is a logarithmed hedonic index of real estate prices deflated by the consumer prices index.

The direction of the impacts of all the variables used on the trend in real estate prices is in line with expectations and it is significant statistically (with the exception of consumer expectations). As expected, the demand variable has a positive impact on price level. The impact of the supply variable is also positive, which is a consequence of the significant representation of the cost component in the construction of that variable. Namely, in most of the observed period the rise in real estate construction costs could mainly be transferred to the end-user, and thus the increase in those costs had no impact on a fall in supply, rather on a rise in the prices of residential property¹³. The real interest rate has a negative impact on prices since a higher interest rate implies a greater household borrowing cost. Consumer confidence index also has, as expected, a negative sign, because an increase in consumer optimism tends to bring about rise in the prices of real estate (Table 1).

The period of credit expansion started at the end of 2002, and in conditions of declining interest rates and increasing consumer optimism both the demand for and the supply of residential property increased. As a consequence the estimated equilibrating real estate price level began to rise faster than the recorded market prices. However, as of 2004 market prices started to come close to the assessed equilibrating level,

and exceeded it by mid-2006. This period lasted until the end of 2012, although, under the influence of credit activity stagnation and increased unemployment, the equilibrating real estate prices had already started to decrease rapidly at the end of 2008. It may be concluded from the conducted analysis that the significant rise in residential property prices achieved in this period was triggered by favourable developments on the demand side in conditions of strong credit expansion, where it needs to be pointed out that the achieved market prices in that period exceeded those implied by values of fundamentals characteristic for the period of relatively strong credit and economic growth.

The difference between the equilibrating and market price (HREPI) in Figure 4 needs to be interpreted, except in the context of short-term undervaluation or overvaluation in relation to fundamentals, also with-in model limitations. Household expectations in future fundamentals (which cannot be adequately included in the model), the absence of other potentially important variables (like a variable to describe the amount of currently unsold real estate in the market, i.e. real estate stock), the relatively short period for which the analysis was conducted and a number of other factors have an important role. The expected further decline in disposable household income, and the still relatively high interest rates and a relatively low level of consumer optimism in 2014 will dissuade the majority of households from new borrowings for housing, so the pressure on further decline in equilibrating, and possibly also in market prices of residential properties might continue.

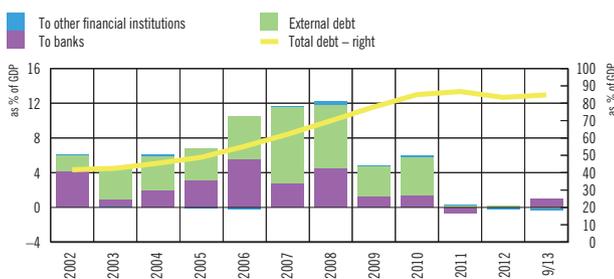
The two presented methods of real estate price assessment (P-I indicator and the error correction model for prices) should be observed within their mentioned limitations but also as mutually complementary techniques. The relatively short historical series of the P-I indicator (in which the period of strong real estate price growth has a significant share, and with new data its impact on average price will decrease) could have as a consequence in the future a further decline in the long-term price level. On the other hand, in the error correction model, the equilibrating price indicates the impact of included fundamentals on the formation of residential property prices, fundamentals that are at the same time important determinants of their future developments.

¹² The consumer confidence index is expressed in the range from -100 to 100, and since it always had negative values for Croatia, for the purpose of this model it was transformed so that it was multiplied by -1 and logarithmed, which means that the growth in this indicator indicates the decline in consumer confidence.

¹³ See A. Ciarlone: *House price cycles in emerging economies*, Banca d'Italia, Working Papers No. 863, 2012.

Non-financial corporate sector

Figure 57 Change in and stock of non-financial corporate debt



Note: The change in the debt stock of non-financial institutions excludes effects of the sale of a portion of claims of a major bank to a company in the direct state ownership of the parent bank in December 2012 and the assumption of a portion of shipyard debt by the government in June 2012. The external debt stock also includes the debt of the CM from 2002 onwards. The figure is based on revised data and includes changes in the classification of sectors. Data on total corporate debt exclude debt to leasing companies in order to avoid a break in the data series caused by the change in the methodology for reporting the value of leasing contracts from 1 January 2011 onwards. Data on external debt exclude round-tripping transaction. Sources: HANFA and CNB.

Figure 58 Annual growth rate of non-financial corporate debt



Note: The year-on-year rates of growth of the debt of non-financial institutions exclude one-off effects of the sale of a portion of claims of a major bank to a company in the direct ownership of the parent in December 2012 and the assumption of a portion of shipyard debt by the government in June 2012. Sources: HANFA and CNB.

The total non-financial corporate debt is stagnant in real terms. A slight growth in the debt of non-financial corporations with domestic banks is a consequence of a nominal rise in the kuna/euro exchange rate and the replacement of external debt of public non-financial corporations. Corporate interest rate risk increased due to the shortened timeframe in which interest rates may be changed as a consequence of amendments in regulations.

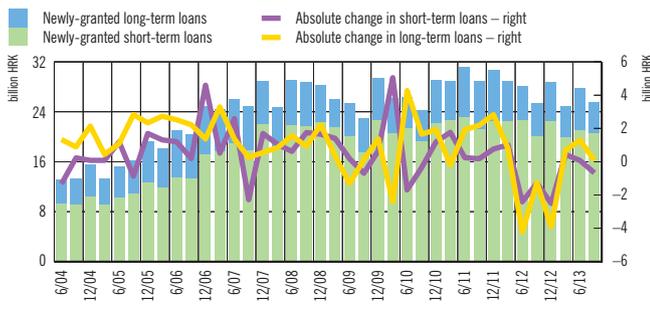
The debt of non-financial corporations increased from 85.4% of GDP to 84.8% of GDP in the first nine months, and this is still a stagnating dynamics (Figures 57 and 58). Non-financial corporations have deleveraged abroad by 0.18% of GDP, which is a consequence of replacement of debt by equities in private enterprises as well as of the replacement of external debt of public enterprises by domestic debt. Due to the 2.17% increase in kuna/euro exchange rate, external debt in kuna increased by 0.76% of GDP, while effectively (excluding the exchange rate effect) the decrease in external debt amounts to 0.94% of GDP. Debt of other financial institutions is stagnating. Thus the growth in total debt presented (Figure 58) is solely the consequence of the increase in debt to domestic banks. A significant impact on increasing debt to domestic banks (0.56% of GDP) comes from the growth in the euro exchange rate since the same period in the previous year, with regard to the fact that almost three quarters of domestic debt were denominated in a foreign currency, more than 97% of this in euros. With the exception of impacts of kuna/euro exchange rate growth and the greatest individual increase of debts of public enterprises, the deleveraging of the non-financial corporations with domestic banks amounts to 0.5% of GDP. The growth in domestic debt is partially the consequence of the new debt of public non-financial corpora-

Figure 59 Non-financial corporate debt



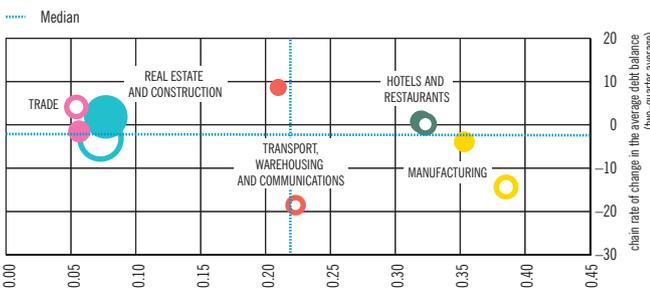
* a Data for 2011 exclude shipyard debt that was assumed by the government in the first half of 2012. Sources: HANFA and CNB.

Figure 60 Newly-granted bank loans and absolute change in the stock of gross loans



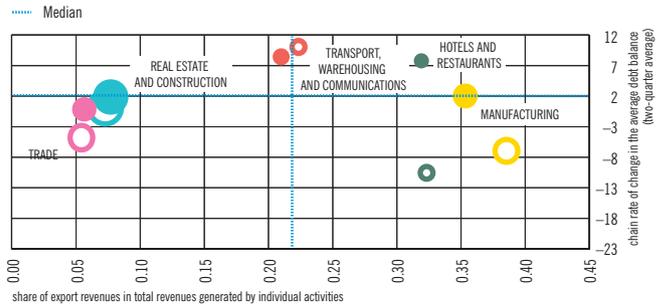
Note: Due to a change in the methodology of monitoring of stock and maturity of loans which are the consequence of change in the classification of sectors, the data from 31 December 2011 onwards are revised in line with the new methodology. The decrease in the stock of loans in December 2012 and June 2012 is the result of the sale of a portion of claims of a major bank to a company in the direct state ownership of the parent bank and of the assumption of a portion of shipyard debt by the government, respectively. Source: CNB.

Figure 61 External debt allocation by sectors from March to September 2013



Note: A full circle denotes the debt dynamics in the last two quarters observed (the average debt balance at end-June and end-September 2013 relative to the average debt balance at end-March 2013 and end-December 2012). An empty circle denotes the same change in the debt balance in the previous period (the average debt balance at end-March 2013 and end-December 2012 relative to the average debt balance at end-September and end-June 2012). The size of the circle denotes the significance of a particular activity's share in total external debt of non-financial corporations. Activities accounting for a relatively minor share in total debt are not presented. Sources: FINA (export and total revenues) and CNB (external debt).

Figure 62 Allocation of domestic bank loans by sectors from March to September 2013



Note: A full circle denotes the debt dynamics in the last two quarters observed (the average debt balance at end-June and end-September 2013 relative to the average debt balance at end-March 2013 and end-December 2012). An empty circle denotes the same change in the debt balance in the previous period (the average debt balance at end-March 2013 and end-September 2012 relative to the average debt balance at end-September and end-June 2012). The size of the circle denotes the significance of a particular activity's share in total external debt of non-financial corporations. Activities accounting for a relatively minor share in total debt are not presented. Sources: FINA (export and total revenues) and CNB (loans by activity).

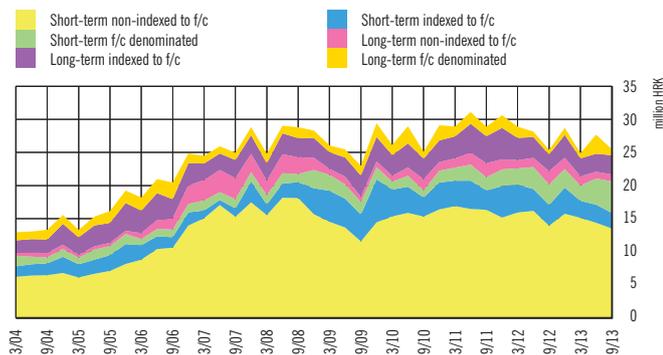
tions due to the realisation of infrastructural projects and the replacement of external by domestic debt.

According to the survey on credit activity conducted by the CNB, the standards for granting loans continue to tighten slightly, as in previous surveys, if the results are weighted at system level with the share in total bank loans. However, according to the survey, the banks with lower credit assets alleviate lending conditions, while the conditions in the banks with greater credit assets remain the same. The survey also shows that the increasing risk perception and negative expectations about economic developments are the major factors explaining why the existing lending conditions hold steady, taking into account also the announcement of their further tightening. Loan demand rose in large enterprises, while small and medium-sized enterprises reduced their demand. According to the survey results, the increase in loan demand was triggered by the still present need for debt restructuring and for financing working capital.

Newly-granted short-term loans stagnated at the level of HRK 20bn, while long-term loans, after an increase in the second quarter, decreased again in the third quarter. Such developments in newly-granted long-term loans were probably the consequence of a still present need for restructuring the debt of non-financial corporations, but also for financing the infrastructural projects of public non-financial corporations, which also affected the growth in the stock of long-term loans in the second quarter of 2013 (Figure 60).

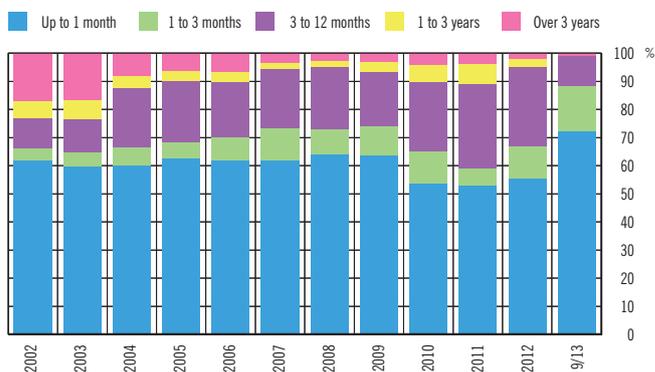
The greatest current growth of external debt in the second and the third quarter of 2013 was achieved in the sector of transport, warehousing and communications, due to the increased investment in acquisitions and expansion of infrastructure in the field of fixed and mobile telecommunications. External debt of other sectors held mostly steady. The sector of transport, warehousing and communications also achieved the greatest increase in domestic debt in the observed period, but in this case this implies the initiation of major infrastructural projects,

Figure 63 Breakdown of newly-granted loans to non-financial corporations by maturity and currency



Note: Short-term loans comprise personal overdrafts, which are statistically recorded as newly-granted loans in each month.
Source: CNB.

Figure 66 Breakdown of bank loans to non-financial corporations by interest rate variability



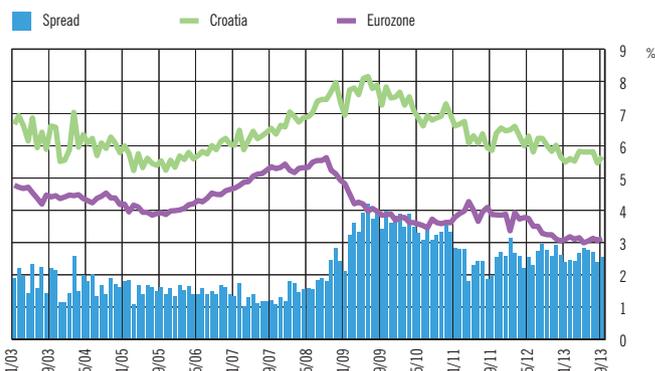
Source: CNB.

Figure 64 Share of corporate non-kuna debt^a in total loans



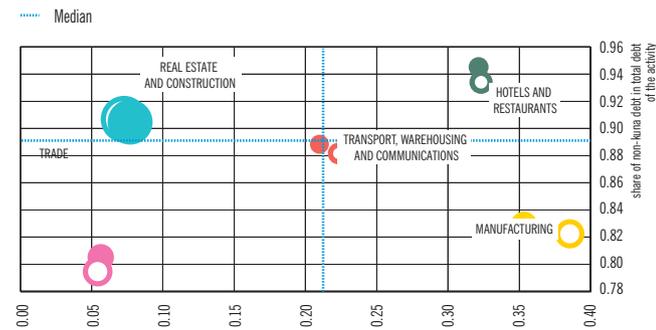
^a It is assumed that total external debt is denominated in foreign currencies. Debt indexed to foreign currencies (a foreign currency clause) is also included.
Source: CNB.

Figure 67 Interest rates on long-term loans to non-financial corporations in Croatia and the eurozone



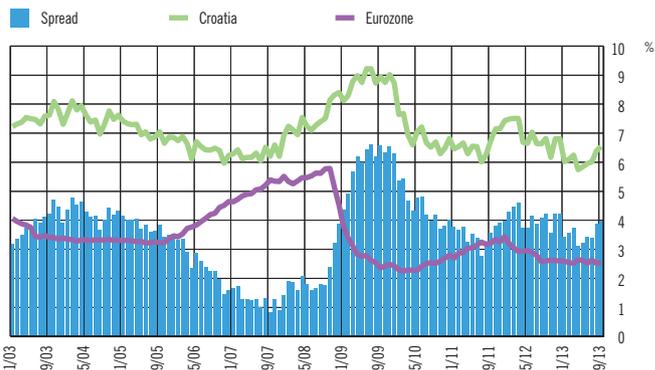
Sources: ECB and CNB.

Figure 65 Currency exposure in September 2013



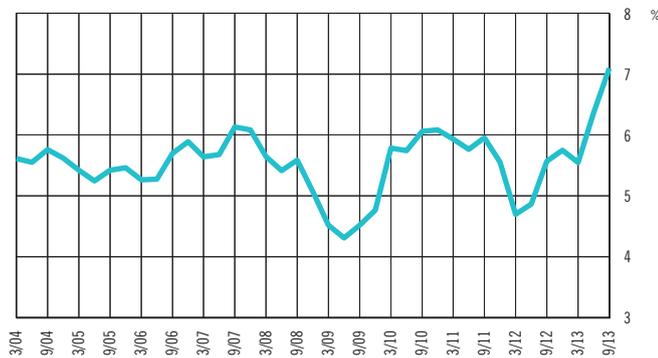
share of export revenues in total revenues generated by individual activities
Note: A full (empty) circle denotes the share of non-kuna debt in March 2013 (September 2012). The size of the circle denotes a particular activity's share in total debt of non-financial corporations. Activities accounting for a relatively minor share in total debt are not presented.
Sources: FINA (export and total revenues) and CNB (loans by activity).

Figure 68 Interest rates on short-term loans to non-financial corporations in Croatia and the eurozone



Sources: ECB and CNB.

Figure 69 Ratio of transaction account deposits of private non-financial corporations to gross value added



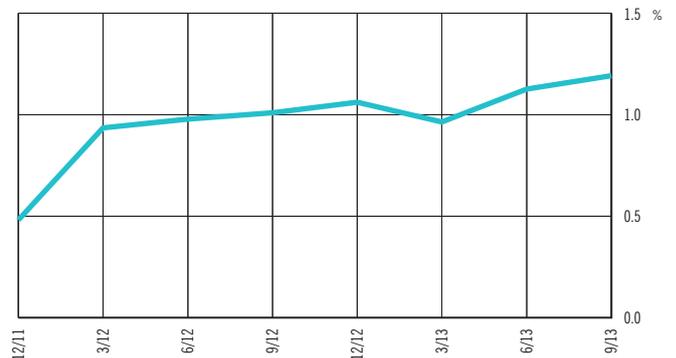
Source: CNB.

with modernisation of railway infrastructure being the greatest. A high rate of domestic debt growth was recorded in the hotel sector as well, where investments in reconstruction, expansion and rebranding of accommodation in major hotel chains were initiated. The growth in domestic debt of the construction sector refers to restructuring of existing liabilities, while the manufacturing industry directs domestic loans to capital investments, technological improvements and improvements of energy efficiency (Figures 61 and 62). The growth in newly-granted loans to non-financial corporations is most evident in long-term foreign currency loans in the second quarter, and in short-term foreign currency loans in the third quarter of 2013. Other newly-granted short-term loans decreased while the level of newly-granted long-term loans in kuna and indexed to a foreign currency remained stable in the first three quarters of 2013 (Figure 63). The share of corporate non-kuna debt in total loans is stagnating, but with minor oscillations that are more evident in short-term debt (Figure 64).

Exposure to interest rate risk increased considerably due to the growth in the proportion of loans in which it is possible to vary the interest rate within a year in total loans. In the last quarter that proportion exceeded 99%, with a special emphasis on the share of loans in which interest rate can be varied within a month and within the period of 1 to 3 months, which is a consequence of the amendments to the Consumer Credit Act (Figure 66).

Interest rate level changes in Croatia follow the movement of interest rates in the eurozone, which reached their lowest levels

Figure 70 Ratio of transaction account deposits of public non-financial corporations to gross value added



Source: CNB.

in the observed ten-year period. The exception are the deviations of interest rates in Croatia for short-term loans, whose price increased in the last quarter, while the price of long-term loans held mostly steady. The differences between interest rates on long-term loans in the eurozone and those in Croatia are higher than the average differences in the pre-recession period, which implies an elevated level of credit risk in the non-financial corporate sector (Figures 67 and 68).

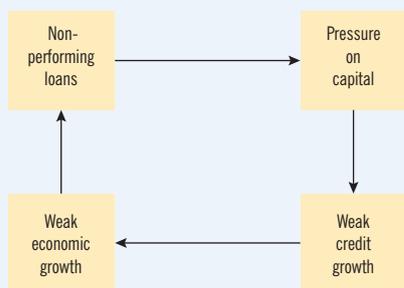
Liquidity risk of private non-financial corporations, measured as the ratio of the transaction account deposits of non-financial corporations to gross value added decreased considerably in the first three quarters of 2013, while the decrease in liquidity risk of public non-financial corporations was less evident. With respect to the changes in classification, especially in public non-financial corporations, the combined presentation of the ratio of deposits to gross value added used so far has been divided into private and public non-financial corporations in order to avoid the structural break in the series. At the same time for public corporations the presentation shows only the period which excludes the break in the series.

Owing to infrastructural projects in the public enterprises segment, which have been initiated, or will be initiated in the forthcoming period, alongside good system liquidity and a further fall in long-term interest rates, a gradual increase in borrowing by the non-financial corporate sector may be expected. This may be expected particularly in case of fulfilment of announcements on the scope of public and private infrastructural projects, including projects in the areas of railways, telecommunications and hotels.

Box 3 Resolution of the issue of non-performing loans of banks in Croatia

Due to the prolonged recession, the performance of the bank credit portfolio in Croatia is becoming an increasingly important determinant of banking sector performance. On the one hand, the value adjustment costs in the current period are a burden on the banks' capital, and on the other hand, the accumulated non-performing assets immobilise a considerable share of banks' balance sheets by burdening current or potential/future credit growth. For those reasons, and due to the expected increase in economic activity in the following period, the cleaning of banks' balance sheets is gradually coming to be seen as an imperative for maintaining a capital strength of banks capable of supporting some forthcoming credit cycle, i.e. for avoiding the vicious circle that leads from non-performing assets to the absence of credit growth and eventually again to non-performing assets (Figure 1). However, the cleaning of

Figure 1 Vicious circle of non-performing loans and weak credit growth



Source: CNB.

Figure 2 Status of Croatian creditors by the criteria of collection of claims from corporates in bankruptcy



Note: The red-shaded (unfavourable) area indicates longer loan collection periods and lower collected amounts, while the blue-shaded area indicates above-average collection and higher collected amounts of NPLs.
Source: World Bank, Donig Business, 39 (mostly European countries).

banks' balance sheets is hindered by conditions of low profitability, so a coordinated action of all interested parties is frequently required in order to improve the performance of the entire procedure.^{1,2}

International comparisons taken into account, Croatia stands out in the group of countries where creditors spend an above-average amount of time collecting claims from insolvent companies and, ultimately, manage to collect an under-average share of claims (Figure 2). Such an unfavourable situation is the result of a number of long-lasting structural barriers. Primarily, judicial proceedings are slow, especially in case of bankruptcy proceedings. Furthermore, there is a certain inertia of banks in deciding to write off a non-performing loan. Finally, some aggravating circumstances, such as the current weak market for the sale of collaterals (primarily real estate), additionally hinder the process of collecting non-performing loans.

The resolution of non-performing loans has been slow in Croatia to date, and only a small portion of non-performing loans have been sold, written off or collected and only seldom have client assets been seized through judicial proceedings.³ It needs to be taken into account that the life cycle of a non-performing loan is relatively long, partially due to the accounting treatment of financial assets, and partially due to the dilatoriness of judicial proceedings, so the fact that the resolution of non-performing loans is accelerated only four to five years after they enter in the non-performing loans group is not surprising (Figure 3).

The government is also interested in accelerating the process of cleaning the banks' balance sheets, as well as the balance sheets of other creditors, and it may get involved in this process by adopting a regulation concerning personal bankruptcy, by assuming a share of assets from creditors (banks) which would in the second step be put to use (renting to citizens) or by amending the tax regulation to stimulate faster loan writing-off. Such actions could accelerate the process of cleaning balance sheets, but it needs to be pointed out that the experiences of other countries indicate that a realistic period for noticeable results to appear is two or three years.

Some banks started more aggressively to clean their balance sheets by selling non-performing placements. Seven banks in the last couple of years sold around HRK 7bn worth of non-performing loans (around 15% of non-performing loans at the end of September 2013). The majority of such loans are sold to associated companies, but the number of transactions in which non-performing loans are sold to private financial intermediaries specialised in collecting claims has also gradually increased. This improves the credit portfolio performance on the banking sector level, and a part of capital is released for credit growth, which however has not yet occurred because of the slackness of demand (Fig-

1 Bearing in mind the complexity of this issue, some countries of the western Balkans, such as Montenegro, Bosnia and Herzegovina and Albania requested help from international financial institutions (The World Bank, IMF) in order to accelerate this process and to increase the outlook for its success.

2 According to the report from the European Banking Coordination "Vienna initiative", Working Group on NPLs in CESE, a share of non-performing loans greater by 10 percentage points leads to a credit growth lower by 4% (excluding secondary effects).

3 According to the CCE data, the number of initiated enforcement procedures in 2013 tripled in relation to 2008.

Figure 3 The former, conservative, approach to dealing with NPLs



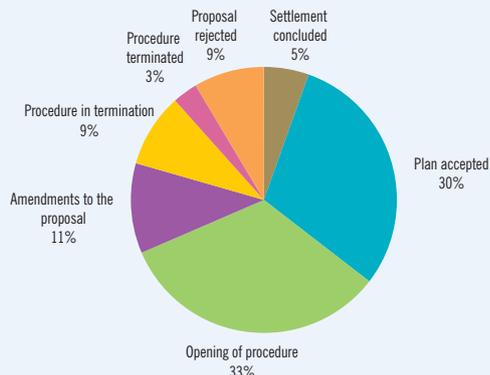
Source: CNB.

Figure 4 Impact of the sale of NPLs on credit portfolio performance



Source: CNB.

Figure 5 Status of pre-bankruptcy settlements of bank corporate clients in pre-bankruptcy settlement procedures



Source: CNB.

ure 4). In the forthcoming period, the continuation, or intensification, of the sale of non-performing loans is expected, especially if the demand for banking products increases, which would then cause a rise in the opportunity cost of an immobilised balance sheet.

Bearing in mind the mentioned inertia of non-performing loans caused to a certain extent by accounting procedures, the Croatian National Bank exerted influence on the banks placement classification by adopting the new Decision on the classification of placements which entered into effect in October 2013. Even though at the beginning value adjustment costs may rise for the banks, these rules will eventually accelerate the process which would occur in the middle term anyway.⁴

An additional impulse to resolving non-performing loans is definitely expected from pre-bankruptcy settlements, which effectively started in 2013, and which enable easier and faster resolution of relations between debtors and creditors without initiating the classic, more expensive and slower bankruptcy proceedings.⁵ At the end of September 2013 there were HRK 48bn in pre-bankruptcy settlements and in the first nine months of 2013, 2700 companies entered into the pre-bankruptcy settlement procedure. However, by the end of September 2013 the results of pre-bankruptcy settlements were relatively modest: only 6% of pre-bankruptcy settlements resulted in a closed deal, while for another 25% of pre-bankruptcy settlements a restructuring plan was adopted (but it does not assume settlement).⁶ The exposure of banks to corporate clients that initiated pre-bankruptcy settlements in the first nine months of 2013 amounts to around HRK 10bn, which accounts for 9.3% of all banks' corporate placements.

At the end of September 2013 the results of pre-bankruptcy settlements in which those banks' clients participated were also relatively modest, and settlement was achieved for only around 5% of the amount of claims. Even though a restructuring plan was adopted for an additional 30% of claims, there is no guarantee that a pre-bankruptcy settlement will be successful (Figure 5).

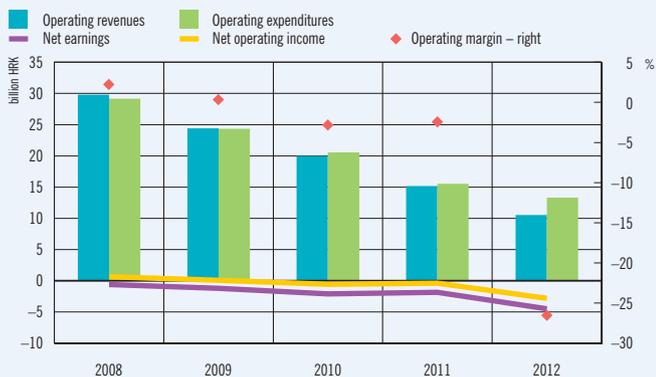
One of the reasons for the current low success rate of pre-bankruptcy settlements is that they tend to involve companies that have operated at a loss for a long time, the relatively low quality of their business plans and restructuring plans being thus not surprising. Although it is true that they suffered a strong fall in business performance in 2012,

4 After the banking crisis in the nineties the coverage of non-performing loans with value adjustments considerably increased in the reclassification process. High coverage at the beginning of the nineties decreased gradually, and this gave an additional momentum to the banks for the upcoming credit cycle in the following decade.

5 Act on Financial Operations and Pre-Bankruptcy Settlement, OG, 108/2012, 144/2012, 81/2013 and 112/2013.

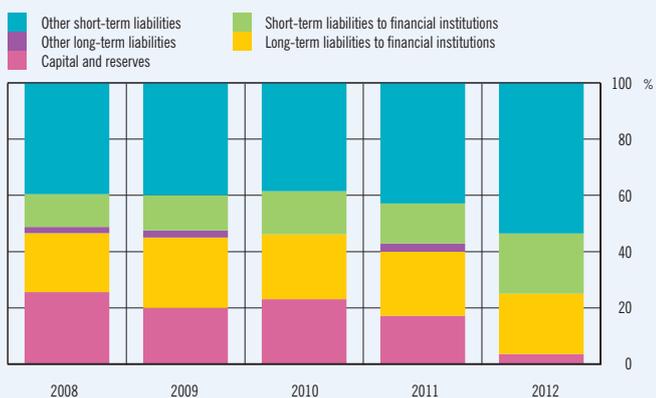
6 An average company had assets in the amount of HRK 20m, and medially in the amount of HRK 1.4m. The number of employed in all companies in pre-bankruptcy settlements is around 42,000. Regarding sector structure, construction companies, manufacturing industries and trade account for around 75% of pre-bankruptcy settlements. Those activities have a considerably greater share in pre-bankruptcy settlements than in banks' exposures (40%/29%, 20%/13% and 14/7% respectively) but that share is also greater than in the assets of all activities, where jointly they have around 66%. Approximately 6% of liabilities of those activities are in the pre-bankruptcy settlement procedure.

Figure 6 Business performances of bank corporate clients in pre-bankruptcy settlement procedures



Source: CNB.

Figure 7 Liability structure of bank corporate clients in pre-bankruptcy settlement procedures

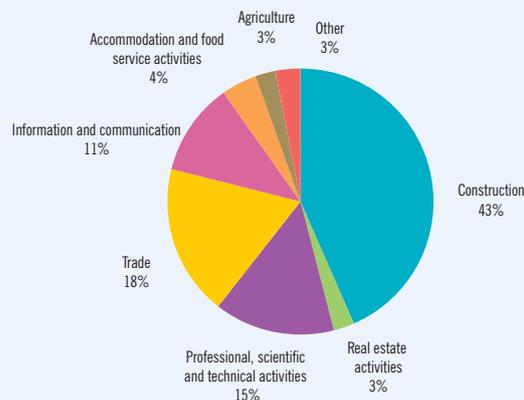


Source: CNB.

banks' corporate clients entering pre-bankruptcy settlement procedures had been incurring losses since 2008. Even though they are now facing somewhat higher post-crisis financing costs, the net earnings of these companies were affected the most by operational performance, which is implied by the fall in the operating margin of companies after 2008 (Figure 6).

The profit and loss accounts and the balance sheets of banks' corporate clients in pre-bankruptcy settlements indicate the materialisation of operational risks. Poor business results in these companies virtually wiped out capital, and debt to suppliers remained almost unchanged in absolute amounts, so their share in the decreased balance sheet of those companies considerably increased. Accumulated debt to suppliers practically stagnates, and the companies failed to decrease this debt considerably by withdrawing deposits. With respect to liabilities

Figure 8 Structure of bank corporate clients in pre-bankruptcy settlement procedures, by activity and in %



Source: CNB.

to banks, the share of long-term liabilities decreased, while short-term liabilities slightly increased. Such developments are the result of a decreased investment activity of these companies, but also of the decisions of commercial banks which tightened the conditions for long-term corporate loans because of their risk aversion (Figure 7).

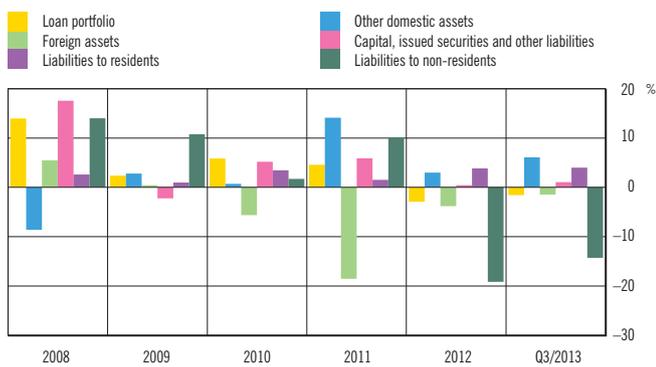
Banks' corporate clients that are currently in pre-bankruptcy settlements mainly come from the construction activity (around 60%) which, together with the trade (18%) and information activities (11%) account for around 90% of all claims to corporate clients in pre-bankruptcy settlements, which is significantly more than the share of these activities in total banks' exposures (around 50%) (Figure 8).

A significant share of corporate placements in pre-bankruptcy settlement procedures assumes that this procedure has a potential, in the middle term, to release a significant share of banks' balance sheets and redirect it to revenue-generating activities. However, in order for such success to occur, the interested parties, including the banks, need to consent to certain compromises, which in the current period may assume a significant write-off cost. The relatively high book-keeping value of these placements in banks' balance sheets somewhat slows down the pre-bankruptcy settlement process. However, the previous write-off of a share of those claims, although with greater current cost, in the middle term gives momentum to banks' earnings and balance sheets in terms of realistically presented assets and a resolution of a share of non-performing loans, which has a positive effect on support to credit growth.

Finally, it needs to be mentioned that pre-bankruptcy settlement has a potential to become a factor in the faster recovery of companies in that procedure, and consequently of the banks' balance sheets. However, that potential greatly depends on the recovery of the business climate and the quality of the pre-bankruptcy settlement conducted. Otherwise, the restructured companies will continue to be observed as risky, and their capital will continue to be burdened by operational difficulties.

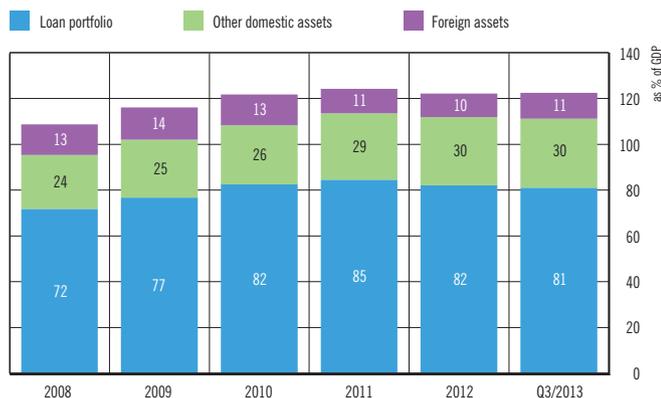
Banking sector

Figure 71 Major banking sector balance sheet items,^a year-on-year rates of change



^a An increase in balance-sheet items at end-September 2013 was calculated relative to September 2012.
Source: CNB.

Figure 72 Banking sector assets



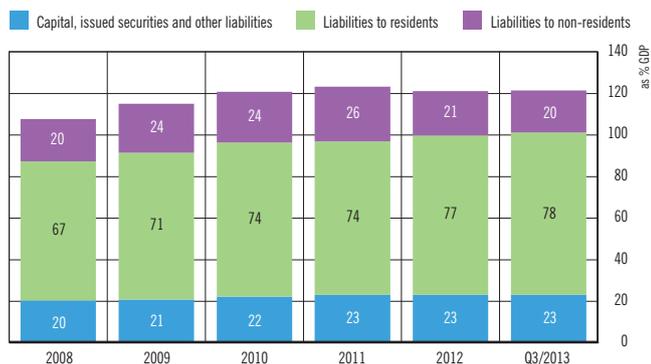
Source: CNB.

The most important risks for the banking sector in 2014 are a further decrease in income accompanied with a rise in value adjustment costs due to credit risk materialisation. In 2014 the implementation of new capital standards (CRR/CRD IV) will also pose a risk to domestic banks as will the reactions of their parent banks in the European Union due to the parallel implementation of that regulatory framework, which could intensify the deleveraging process. Finally, the banks' business strategy, directing investments to less risky government placements will in the middle term have a negative effect on the profitability of banks. For the time being, the banking sector is capable of sustaining pressures that might generate a further increase in value adjustment costs due to the new regulations, along with the classic portfolio ageing effects due to weak demand, and the length of the contraction in real economic activity.

Balance-sheet vulnerabilities¹⁰

The main characteristic of balance sheet adjustments in this year relates to the considerable level of risk aversion in the financial sector, with evidently dampened impulses from the demand side. This reduced the structure and the level of vulnerabilities in banks' balance sheets, but at the cost of cumulating middle-term risks of somewhat weaker future income, with a potential further quality deterioration of older loan portfolio segments. In the part of the year up to September 2013 the banks de-

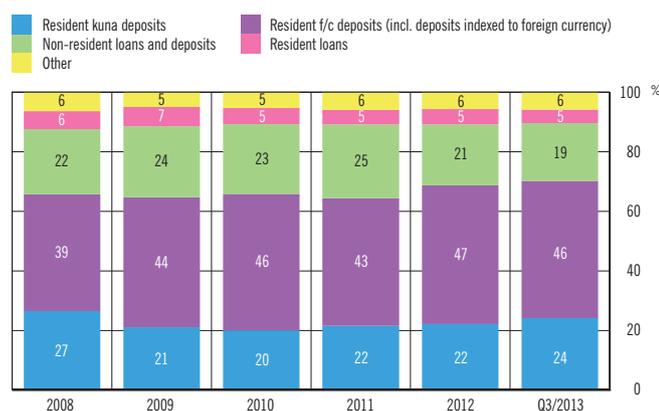
Figure 73 Banking sector liabilities^a



^a Collectively assessed impairment provisions represent the difference between banking sector assets and banking sector liabilities and capital.

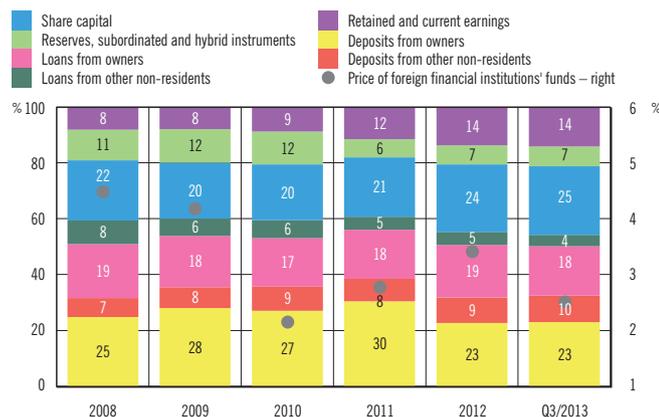
Source: CNB.

Figure 74 Structure of liabilities



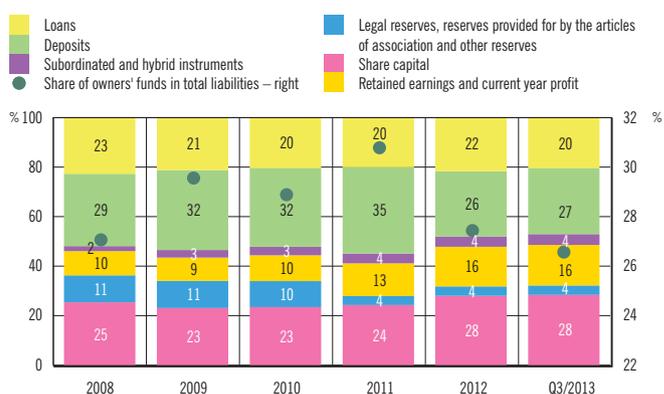
Source: CNB.

Figure 75 Structure of foreign-source funds



Source: CNB.

Figure 76 Breakdown of bank owners' funds by instrument



Source: CNB.

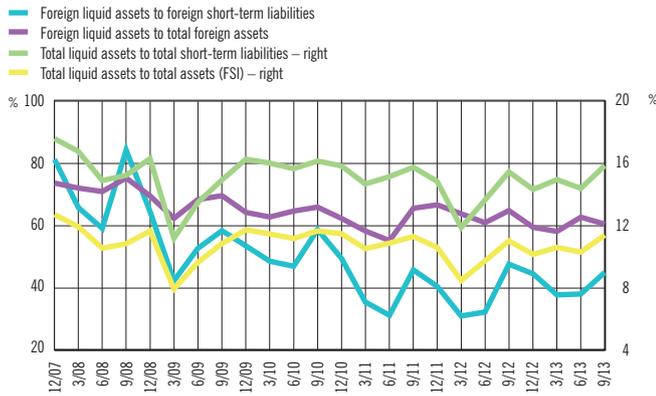
creased their total assets nominally and effectively (1.0% and 1.2% respectively), primarily by decreasing their exposure to the private non-financial sector, while putting free resources into domestic liquid assets, government securities and foreign liquid reserves, which raised liquidity indicators (Figures 71, 72, 73 and 77).

Stagnation of the aggregated loan portfolio primarily reflects the decreased loan demand of the private sector. The banks directed liquidity surpluses mostly to the financing of general government fiscal needs by granting it loans (growth of 9% in the first nine months of 2013) and by purchasing government securities which at the end of September 2013 reached an 11% share (the highest so far) in banks' assets (Figures 71 and 72).

The banks partially used the usual seasonal growth of the domestic deposit base, generated by this year's foreign currency inflow in the tourist sector, for a temporary decrease in liabilities to foreign owners and thus contributed somewhat to the stabilisation of financing sources of the domestic credit activity. All this improved the banks' liquidity position. In the period from September 2012 to September 2013 the liabilities to foreign owners decreased by a total of 18%. However, despite seasonal oscillations and a years-long trend of decreasing those liabilities, the share of foreign owners in bank liabilities is still relatively high (around 26% at the end of September 2013, the same percentage as before the crisis), and their share in total foreign financing sources has slightly increased (to 85%) (Figures 73, 74, 75, 76 and 77).

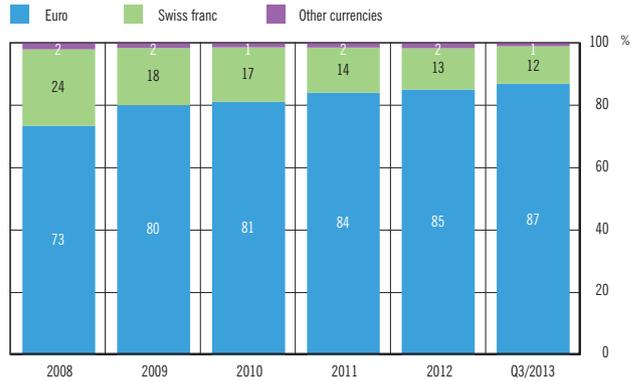
10 Aggregate balance sheet statistics were considerably affected by a large bank that at the end of 2012, in order to reduce the ratio of non-performing loans, sold about HRK 5.6bn worth of claims (net value of HRK 3.7bn) to a company owned by its parent.

Figure 77 Liquidity indicators



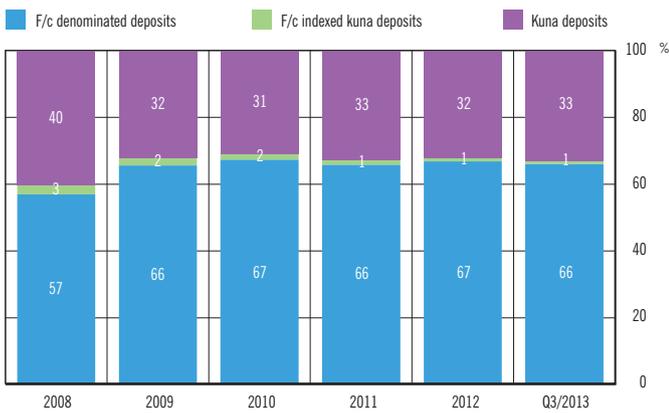
Source: CNB.

Figure 80 Currency breakdown of non-kuna loans



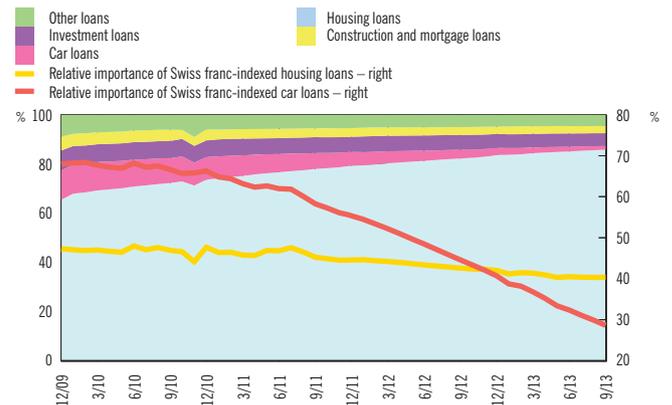
Source: CNB.

Figure 78 Currency breakdown of deposits



Source: CNB.

Figure 81 Breakdown of Swiss franc-indexed loans



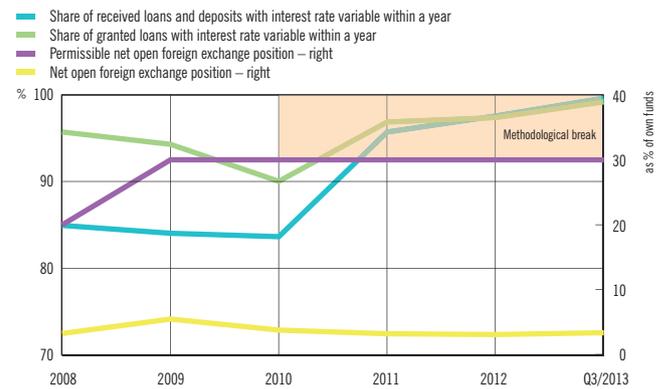
Source: CNB.

Figure 79 Currency breakdown of loans



Source: CNB.

Figure 82 Bank exposure to direct currency and interest rate risks



Source: CNB.

Despite a somewhat lower price of foreign funds, which has been decreasing after a leap in 2012, the banks continue to optimise the structure of their liabilities and in the absence of lending growth continue to deleverage against their owners. The volatility of reference rates in 2011 and 2012 continues to be a warning of possible fluctuations of foreign financing costs. In the event of potential repeated growth trends and the respective increased volatility of those rates, the banks would probably additionally decrease the foreign component of liabilities and react to potential cost pressures which might arise from a sudden and unpredictable price dynamics in foreign financing. However, the impact of the new decentralised financing model for branches of European banks needs to be highlighted, and it relies on domestic sources of financing, which the new regulatory framework prefers.

Despite the changes in maturity and sector structure of loans and deposits after the crisis, these balance sheet segments of assets and liabilities still reflect a relatively low exposure to direct currency and interest rate risks (Figures 78, 79, 80, 82 and 83). However, the exposure to currency-induced credit risk is high as usual, even though the level of protection in the corporate sector slightly increased after 2012 and stabilised in 2013. The household sector continued to be poorly hedged against currency-induced credit risk.

Loans indexed to the Swiss franc are slowly disappearing from the banks' balance sheets, while the quality change has an increasing impact on loan portfolio structure. However, the depreciation of the kuna against the franc in the last few years and the generally weak credit growth maintained the share of housing loans in that currency above 40% (Figure 81). The amendments of the consumer credit regulations led to a significant loss of interest income from Swiss franc-denominated housing loans, from which the banks as a rule have lower earnings due to low quality.

The expected slightly more favourable macroeconomic trends in the following year¹¹ will not be sufficient to reverse the trend towards stagnation in balance sheets or to change their structures and qualities. For now the banks are using the remaining manoeuvring room passively, and have orientated themselves towards low-risk placements to public enterprises and to central and local government. Pre-bankruptcy settlements whose purpose is to ensure liquidity and the solvency of debtors affect the restructuring process, but according to the settlement agreements their progress is slow for the time being. Nevertheless, they do have a potential to free banks' capacities for a more flexible balance sheet management, even though it is not easy to predict to what extent they could contribute to the revitalisation of the credit cycle (for more details on this see Box 3 Resolving of the issue of non-performing loans in Croatia).

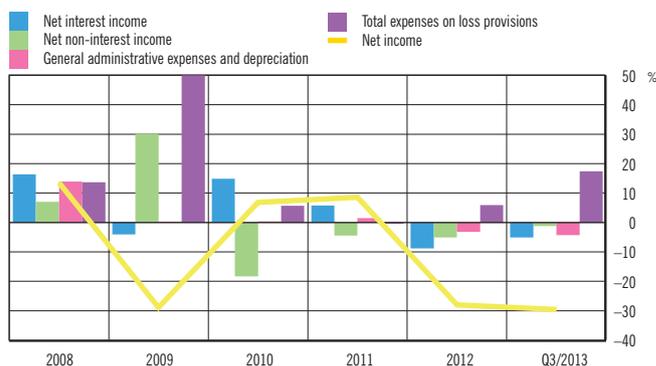
11 See more on macroeconomic outlooks in the next period in the Macroeconomic environment section.

Figure 83 Share of unhedged loans in total loans exposed to CICR^a



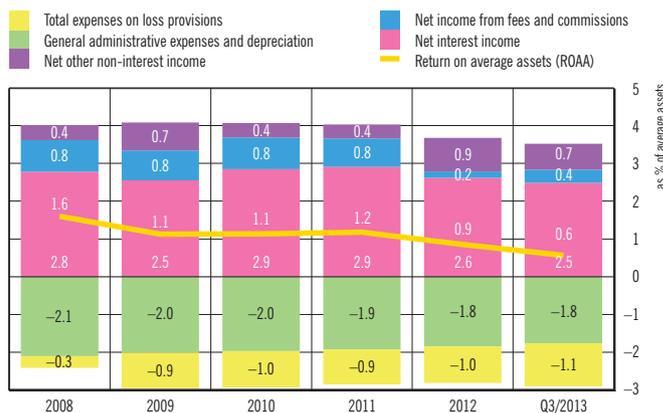
^a Under new rules, CICR and several other risks have been transferred to the second pillar of the new framework of capital calculation, i.e. regulations on internal capital of credit institutions.
Source: CNB.

Figure 84 Change in selected business performance indicators^a, year-on-year rates of change



^a Total expenses on loss provisions increased by around 220% in 2009.
Source: CNB.

Figure 85 Contribution of ROAA categories



Source: CNB.

Figure 86 Contribution of ROAE categories



Figure 87 Structure of total income

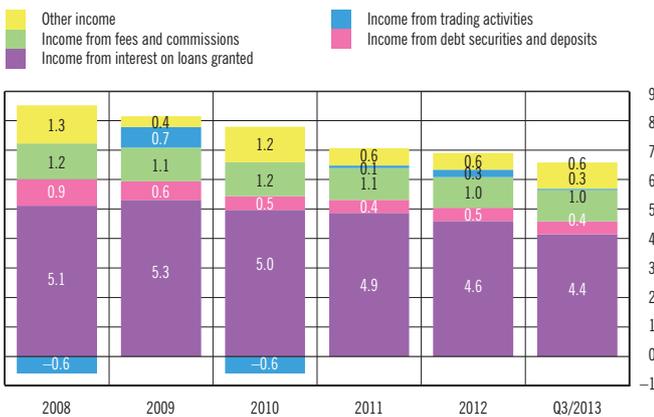
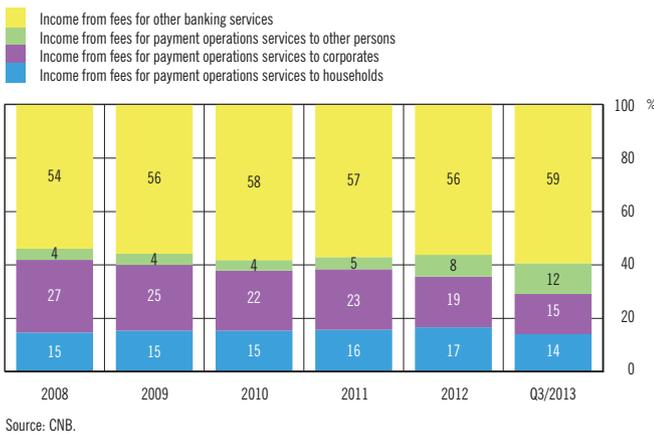


Figure 88 Structure of income from fees and commissions



Strategic risks¹²

Bank's performance continued to deteriorate under the impact of credit risk materialization and business reorientation towards safer positions, which have proved to be a first optimisation reaction, but not a sufficient compensation measure. In the first nine months of 2013 the combination of weaker interest income (which recorded an annual drop of around 5%) and significantly higher value adjustment costs (in the same period a growth of around 17%) led to a decline in net earnings of around 30%. The drop in earnings could be even more evident by the end of the year due to the implementation of stricter measures for non-performing loans management.¹³ (Figure 84).

The strategy of giving priority to risk-free positions reduces the banks' profit potential, which has a negative feedback effect on their capital. However, investing in safer assets was primarily a part of a kind of arbitrage used to decrease risk weights and regulatory operating costs (Figures 85 and 86).

Despite a significantly greater volume of securities in banks' balance sheets, there was no rise in interest income from these instruments. In the conditions of low interest rates a considerable income from securities is possible only through investments in assets with a greater risk weight. Since the rise in the share of securities refers primarily to the government, the ratio of interest income from those instruments to banks' assets actually decreased (Figures 87 and 88).

A further decline in loan quality with new regulatory rules on classification had led by late 2013 to a considerable growth in value adjustment costs. The banks' continuing rationalisation of business and lower interest expenses support their operating performance, but the basic problem remains the weakening of interest income in a period of increasing value adjustment costs (Figure 89).

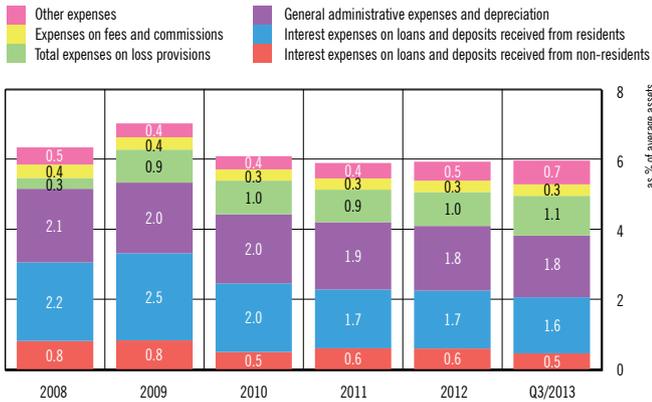
An increase in banks' earnings in the short term is still not possible, especially due to the recent concentration on institutional clients which does not enable credit expansion and the related sales. Operating costs savings continue, but their effects are limited due to fall in marginal returns and they provide insufficient manoeuvring room for a stronger impact on earnings.

After the beginning of the financial crisis, a considerable growth in government placements was recorded in Croatia, as in the majority of countries in CE Europe (Figure 90). The decreased aggregate demand and the suppressed expectations of the pri-

¹² Income statement items for September 2013 were annualised to be comparable with those for the preceding whole year periods. This was made by summing up banks' business results in the last quarter of 2012 and the first three quarters of 2013.

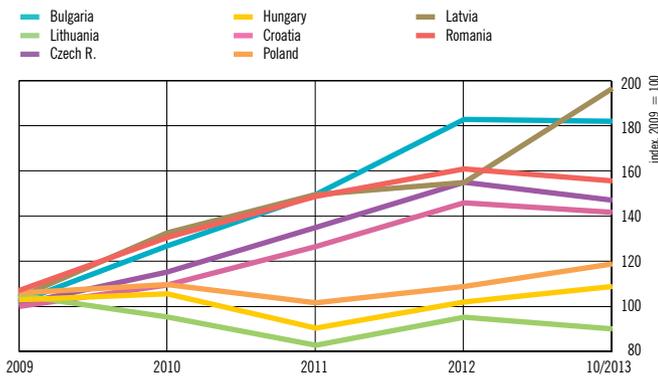
¹³ Decision on amendments of the Decision on placement classification and off-balance liabilities of credit institutions, OG 89/2013.

Figure 89 Structure of total expenses



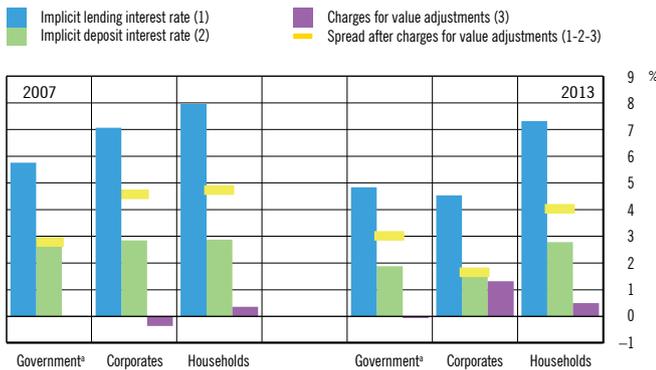
Source: CNB.

Figure 90 Growth of placement to the government in selected countries



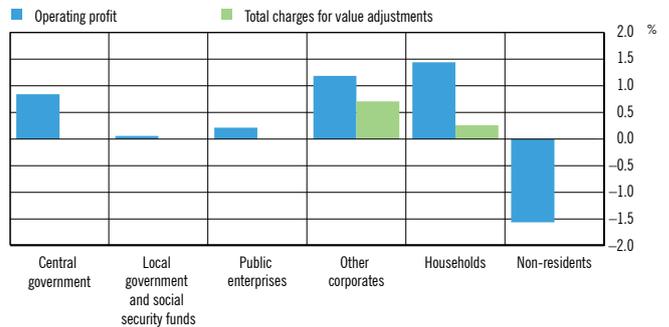
Source: ECB.

Figure 91 Change in bank profitability in various segments of financing in the period of crisis



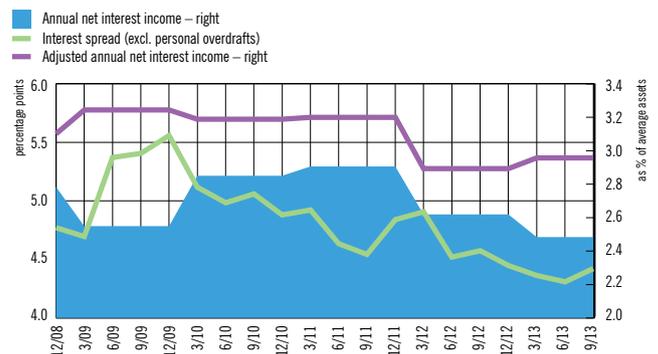
^a Includes loans and debt securities for the central government, local government and social security funds.
Source: CNB.

Figure 92 Contribution of individual sectors to net operating income and charges for value adjustments, as percentage of assets, on 30 September 2013



Note: The central bank and domestic financial institutions are excluded. The large negative position of non-residents is attributed to the fact that this sector represents a significant source of finance for banks, and accounts for an insignificant share in the loan portfolio.
Source: CNB.

Figure 93 Interest spread (quarterly average of monthly interest rates on newly-granted loans) and annual net interest income



Note: Net interest income of banks has been adjusted by income from trading activities and exchange rate differences.
Source: CNB.

Figure 94 Selected interest rates (quarterly average of monthly interest rates)

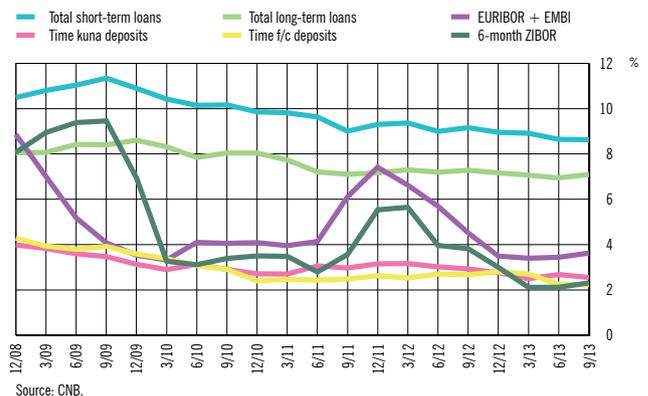


Figure 95 Share of short-term loans in total newly-granted loans (quarterly average)

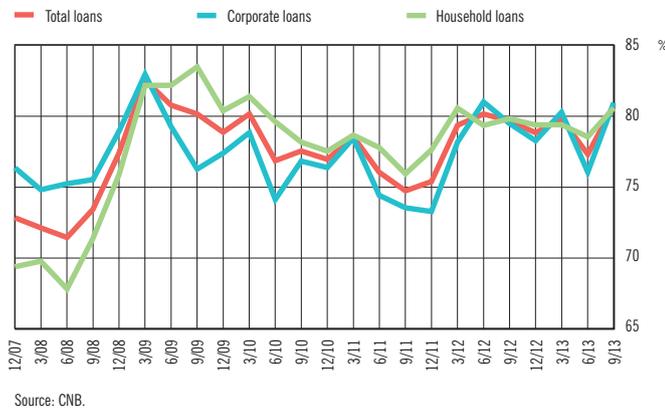


Figure 96 Ratio of non-performing loans to total loans

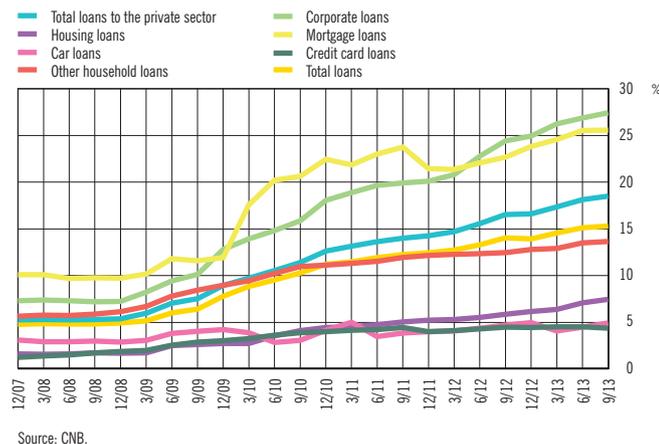
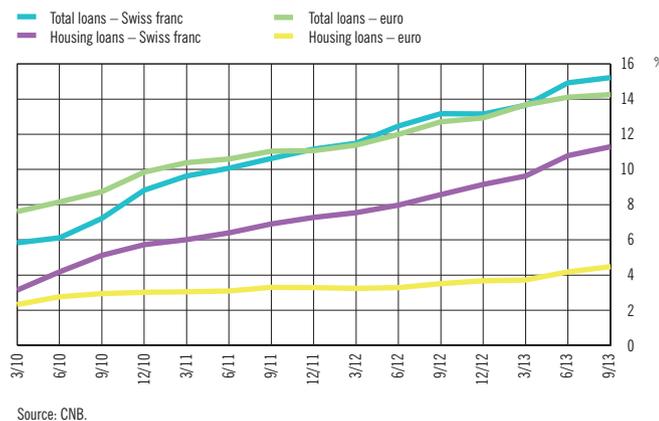


Figure 97 Ratio of non-performing loans to total loans by loan categories and the currency of indexation



private sector in the period of growing risk aversion and required yields contained credit activity in Croatia, so the banks found themselves in the situation of having to maintain significant surpluses, and at the same time the government failed to carry out fiscal consolidation, partly due to limitations in the form of a decreased tax base in the time of crisis. Under such circumstances the banks, which still have the support from foreign owners, readily turned to financing the public sector deficit, which is treated as risk-free (a consequence of the considerably greater financial support to the central government, while lending to local government stagnates), which in the short term, creates the best ratio of costs to benefits (Figure 91).

The decrease in the government share in the banks' portfolio will depend primarily on the credit potential in the private sector and the government's cheaper borrowing prospects. In the meantime, the share of income from the government in banks' earnings significantly increased (Figure 92). Additionally, greater orientation towards the government to some extent helps the banks to decrease operating costs since they are at minimum levels when dealing with the government. On the other hand, this exposes them to medium-term risks related to limitations of the fiscal deficit as well as to the mentioned medium-term risks of weaker income from the private sector.

Interest margins continue to drop due to the decrease in loan share in assets and due to the growth in non-performing loans. Such developments may help slow down the disintermediation process, by balancing its scope with the needs and capacities of deficit agents (Figure 93). The banks continue to maintain relationships with existing clients by servicing their needs at least in the short term, thus the share of short-term loans in total newly-granted loans is still very high. However, short-term loans are an example of how even expensive products do not have greater net effect due to the fall in asset quality.

Interest rates remain at low levels at the moment, and the banks are decreasing their dependence on market financing by optimising balance sheets. In this sense the shock of reference rate growth, like that recorded at the end of 2011 and at the beginning of 2012, would be easier to absorb by banks (Figure 94).

As well as gradual economic recovery, a slight rise in private sector loans may be expected in 2014, which will positively contribute to the banks' performance. However, without an exogenous stimulus, like a faster resolution of non-performing loans, a considerably improved business climate or, for example, new competitors on the supply side, there will be no major changes in banks' business policies since the government as a client currently has a good ratio of gain to investment. In addition to financing current transfers, capital investments and refinancing domestic and foreign liabilities of the public sector (this affects aggregate demand in the short term), financing should be directed towards direct corporate lending, which supports middle-term growth. Namely, the presumed growth in personal income and corporate profit in that situation would alleviate the burden of household and corporate loan repayment and it would revitalise the creditworthiness of these sectors in

general. Otherwise, the social costs of the crisis will continue to burden the budget, additionally decreasing the potential for public investments.

Credit risk and bank capital adequacy

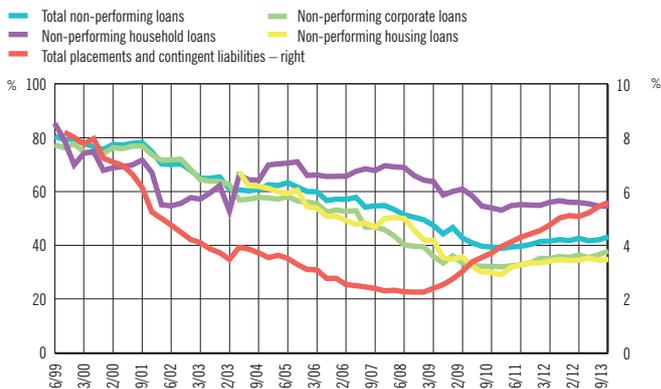
The quality of the aggregate portfolio of banks continues to deteriorate, partially under the impact of economic contraction, which endangers the continuity of loan repayment, and partially due to the classical ageing of the portfolio due to a weaker financing of new investment and private consumption. At the end of September 2013 the share of total non-performing loans and loans reached 15.3% in total, and 18.5% in loans to the private sector: 10.6% in the household sector and 27.4% in the corporate sector (Figure 96). The somewhat slower growth in the share of non-performing loans starts to be affected by the fact that loans granted in the period after the crisis are on average better in quality. Additionally, shares of non-performing loans would be considerably higher if certain banks had not sold parts of their poor credit portfolio¹⁴ (for more details see Box 3 Resolving of the issue of non-performing loans in Croatia, Figure 4).

Although corporate loans still contribute the most to the growth in the share of non-performing loans, the contribution of the household sector is increasing, and this need to be related to materialisation of the currency-induced credit risk which is recorded in housing loans indexed to the Swiss franc. However, the improvement of those trends could be triggered by the entry into force of a new Credit Consumer Act, which contains significant relief to the bank clients with Swiss franc-indexed housing loans (Figure 97).

The ageing of non-performing loans causes an increase in required coverage with value adjustments, since they move to higher risk categories, which will be additionally accelerated at the end of this year and at the beginning of next year through regulatory amendments concerning placement classification. At the end of September 2013 the coverage rose to the highest level since end-2009, but the price of that increase was the highest value adjustment costs in the crisis period. This refers to the phenomenon that value adjustment costs are not necessarily linearly related to the share of non-performing loans. The rise in coverage of non-performing loans with value adjustments protects the capital and decreases the pressure on it coming from uncorrected non-performing loans in the observed period, but it also burdens current earnings. Such a trend should be expected in the forthcoming middle-term period (Figures 98 and 99).

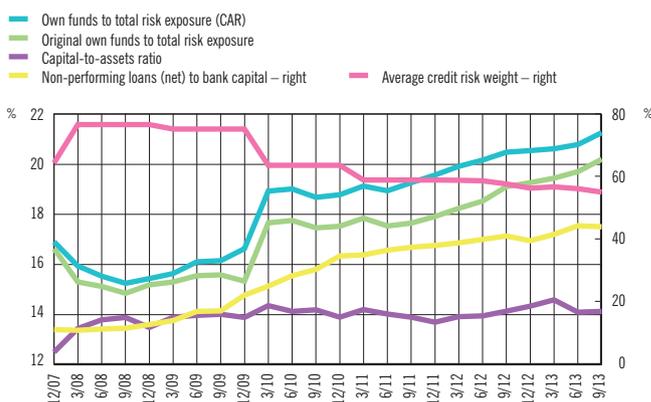
In this period the continuation of the sale of non-performing banking loans may be expected. This procedure will, among other things, make banks more attractive to purchasers in the

Figure 98 Coverage of total placements and contingent liabilities by value adjustments



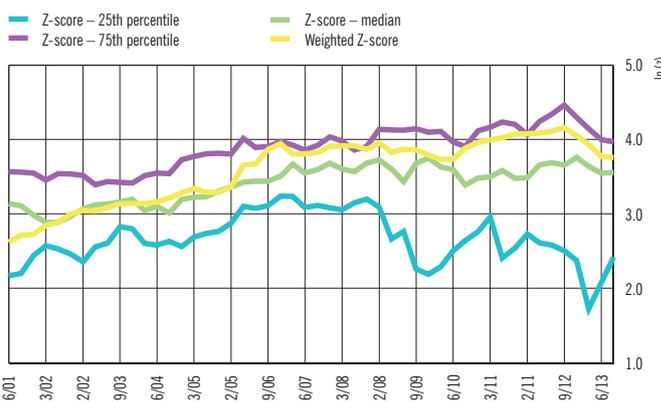
Source: CNB.

Figure 99 Capital adequacy ratios



Source: CNB.

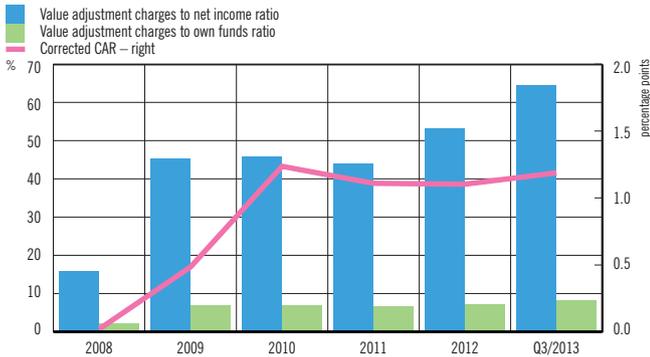
Figure 100 Distribution of insolvency risk



Source: CNB.

¹⁴ In that case the aggregated indicator of the non-performing loan share would be 17.2%, not 15.3%.

Figure 101 Balance sheet buffers to amortise shocks and the CAR corrected by the fall in the coverage of non-performing loans



Note: The correction of banks' CAR for the fall in the coverage is made in relation to the coverage level of 50%, which is an average for the 2004–2013 period.
Source: CNB.

period of further consolidation of the banking sector on the EU level.

The record-high capital adequacy ratio of the sector needs to be observed through taking into account the high potential risk level and the currently lowest risk weight, so, despite the solid capitalisation, which has actually been the same for the past five years, the stability of the sector in terms of the Z-score has decreased. The decrease of the Z-score of banks in the period in which their capitalisation has been stable is a result of the decline in their earnings, with considerable fall in earnings recorded in the banks that were the most stable so far. Such developments led to a fall in weighted Z-score, but also to a decrease in the differences of that indicator among banks (Figures 99 and 100).

Banking sector resilience

Banks' buffers to shocks decreased due to the weakening of banks' income and the growth in value adjustment costs and a parallel stagnation of banks' capital. At the end of September the annual value adjustment costs amounted to around 65% of the net income of banks, while the ratio of those costs to liable capital increased moderately to slightly above 8% (Figure 101).

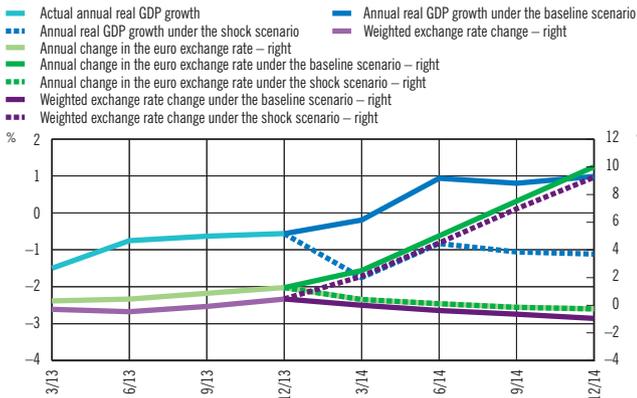
Figure 102 Distribution of NPLR



Source: CNB.

However, on the other hand, the above mentioned increase in the coverage of non-performing loans in the middle of the year decreased the burden of capital with uncorrected non-performing loans. Additionally, that process decreased the impact of a potential shock which would arise due to the increase in coverage of non-performing loans to the average level of the last nine years. At the end of September such a shock would decrease the capital adequacy ratio by around 1.2 percentage points, which relativises the results of the stress testing (Figure 101).

Figure 103 Projections of macroeconomic variables under various scenarios

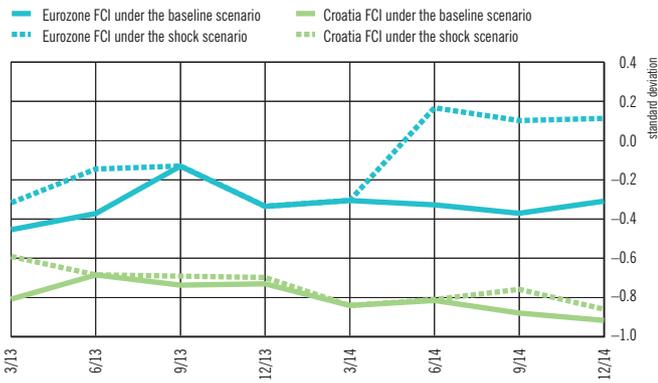


Source: CNB.

In the meantime, the dispersion of the share of non-performing loans in the banking sector stagnated at the end of 2013 and implies similar common trends in changing the banks' credit portfolio quality: a further rise in the number of defaults, even though at a moderate pace. In comparison with the previous crisis (1999) the shares of non-performing loans are considerably greater today, but those differences do not arise from the relatively poorer risk management or from less capitalised banks. On the contrary, the system characteristics are more favourable. However, it has been hit by the long-term crisis and the related deteriorating business climate and confidence as well as by the increase in risk aversion, which created a greater cumulative income loss. That is evident from the comparison of the share of non-performing loans, which was considerably more relaxed in comparison with the previous one, and three times the amount of time was necessary for the average share of non-performing loans to reach the levels that in the previous crisis were reached extremely quickly (Figure 102).

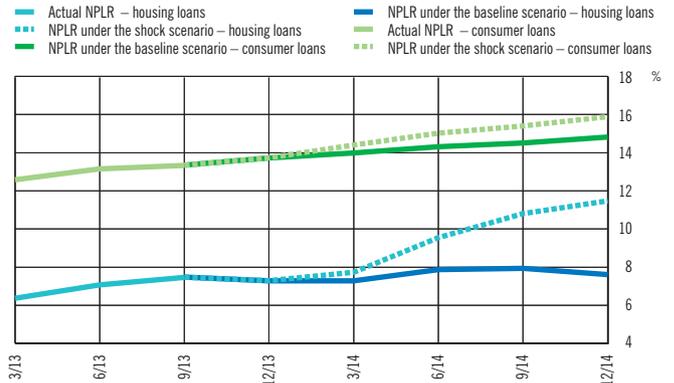
The conducted stress testing exercise for the banking sector for 2014 indicates that the banks' buffers created in the previous period continue to be sufficient at an aggregated level in

Figure 104 Financial conditions indices under various scenarios



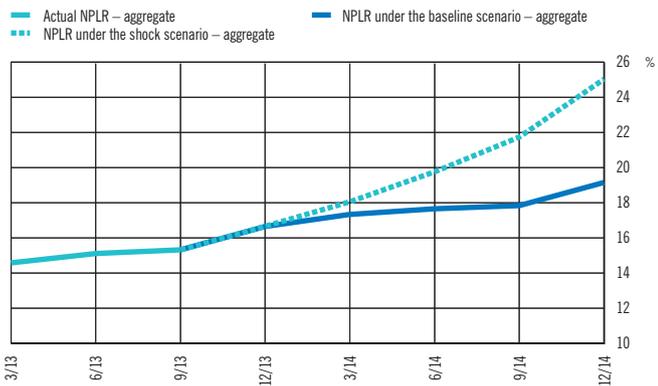
Note: Positive (negative) values denote a deterioration (an improvement) of financial conditions.
Source: CNB.

Figure 107 Projections of non-performing housing and consumer loans under various scenarios



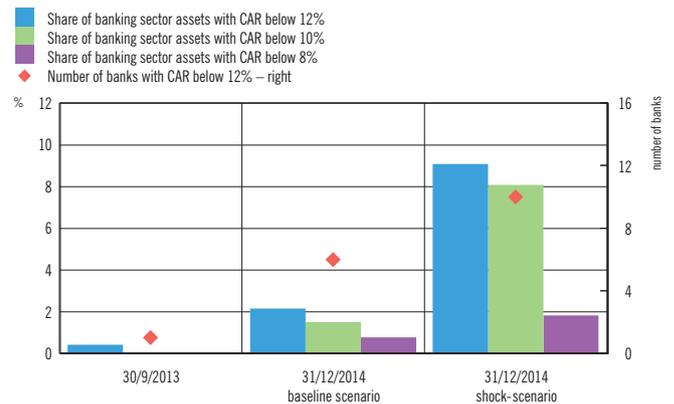
Source: CNB.

Figure 105 Projections of NPLR under various scenarios



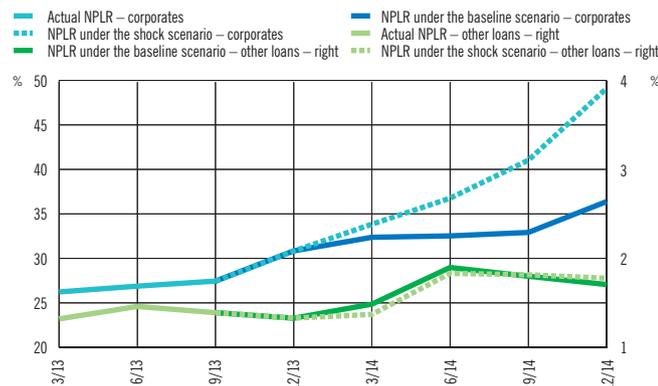
Source: CNB.

Figure 108 Breakdown of banks and their assets by CAR under various scenarios



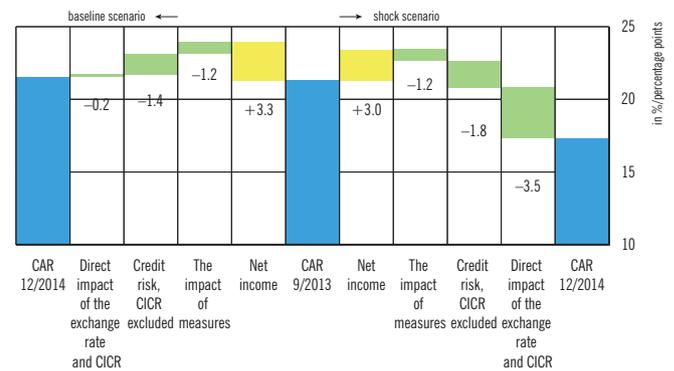
Source: CNB.

Figure 106 Projections of non-performing loans to corporates and other loans under various scenarios



Source: CNB.

Figure 109 Contribution of individual components to the change in CAR under various scenarios



Source: CNB.

Table 6 Dynamics of CAR under various scenarios

	Balance 30/9/2013 (%)	31/12/2014 – baseline scenario (p.p.)	31/12/2014 – shock scenario (p.p.)
CAR	21.3	0.5	-3.5

Source: CNB.

the case of highly unlikely but plausible macroeconomic shocks (Figure 108 and Table 6).¹⁵ Resilience analysis was conducted in two scenarios. The most probable, baseline scenario, includes the cessation of negative trends in economic activity, as part of which the real GDP in 2014 would increase by 0.7% and the kuna/euro exchange rate would remain relatively stable.¹⁶ The shock scenario, which analyses resilience to a highly unlikely but plausible combination of shocks, assumes a 1.2% decline in real GDP, the continuation of recession and a possible resurgence of the financial crisis in the eurozone and the consequent deterioration of financing conditions for domestic entities and cumulative depreciation of the kuna by around 10% in relation to the baseline scenario, assuming that the euro/Swiss franc exchange rate is similar to that in the baseline scenario (Figures 103 and 104).

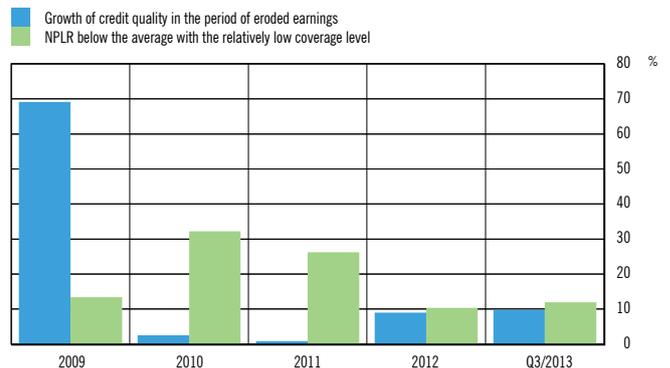
Thus, after a projected level of around 16% at the end of 2013, the share of non-performing loans under the baseline scenario could reach around 19% at the end of 2014, which would continue the trend towards a decrease in the growth of this share that started in 2012. Under the shock scenario, the share of non-performing loans would increase strongly, amounting to 25% at the end of 2014 (Figure 105). The corporate portfolio still contributes the most to the dynamics of non-performing loans. Under the baseline and shock scenarios, the ratio of non-performing corporate loans at end-2014 stands at 36.4% and 49% respectively. In the household lending sector, non-performing loans would reach 15% and 16% respectively under the baseline and shock scenarios at the end of the projection horizon, while the ratio of non-performing home loans, so far relatively low, would grow moderately, to 8% and 11% respectively (Figures 106 and 107).

By the end of 2014 the expected impact of the changes in the legislative framework in the segment of placement classification and interest rate regulations should decrease the capital adequacy ratio by around 1.2 percentage points, by decreasing the expected banks' earnings.¹⁷ Part of those measures is focused on a more cautious loan classification and on additional alloca-

¹⁵ The conducted resilience analysis of the banking sector is based on the sector models of credit risk indicated in *Financial Stability*, No. 7, June 2011. Credit risk models enable a simulation of the impact of macroeconomic shocks on changes in the riskiness of individual loan groups. Thereby, the impact of the macroeconomic scenario on each bank is manifested depending on the structure, i.e. the risk profile of its credit portfolio (corporate, housing and consumer loans and other loans). In addition, the modelling of bank earnings for different segments of operating income is integrated with this approach and yields more realistic results than formerly used expert assessments in the context of resilience analysis.

¹⁶ The projection for the kuna/euro exchange rate and for the euro/Swiss franc exchange rate is taken from *Consensus Forecast*, November 2013.

Figure 110 The share of bank assets selected by potential risk indicators



Source: CNB.

tions of value adjustments, so that cost should be understood conditionally, since it will serve the purpose of recapitalisation in the case that credit risks do not materialise completely. On the other hand, in changes related to consumer credits, there is no strengthening of the banks' capital, and banks experience a cost which, in contrast, creates a burden on their capital, in conditions in which banks' profitability is already eroded by the value adjustment costs. However, in the housing loans portfolio positive effects of the regulatory amendments on quality may be expected, due to the eased burden of loan repayment, and so the loss of a part of income will be compensated by somewhat lower value adjustment costs.

Assuming static behaviour of banks,¹⁸ i.e. absence of balance sheet reactions to the regulatory amendments and with a standard presumption on retaining profits in their entirety, the capital adequacy ratio of the sector in the baseline scenario would increase by 0.5 percentage points at the end of 2014 from September 2013 (Figure 109 and Table 6). The results of that recent analysis of resilience are somewhat more unfavourable than the previous ones. Alongside additional value adjustment costs due to new loan classification rules and due to a somewhat lower net income due to the continuing growth in non-performing placements and the effects of the Credit Consumer Act, the reason for this is also the inability of the relatively modest expected economic growth to reverse the trend in non-performing loans (Figures 105 and 109).

¹⁷ Projected GDP values under the shock scenario were obtained based on quantile vector autoregressions to which financial condition indices and GDP growth rates for Croatia and the EU were introduced. The shock scenario was constructed as the outcome that covers 5% of the worst outcomes for the given baseline scenario. For more details see *Box 1 Financial conditions and real economic activity*, *Financial Stability*, No. 8, January 2012.

¹⁸ According to the new regulatory standards, the stress test results will be carried out and published as of the next issue of *Financial Stability* (for more details see *Box 5 Monitoring systemic risks and creation of macroprudential policy*).

Value adjustments on loans would be even higher under the shock scenario, while net income would remain nearly unchanged. In addition to the impact of a major downturn in GDP, this is due to exchange rate changes that would activate currency-induced credit risk. Under such a scenario, the capital adequacy ratio of the banking system would decrease by 3.5 percentage points and it would be by 4.0 percentage points lower than under the baseline scenario, where the potential kuna depreciation appears as the most important factor of capital adequacy decline, since besides activating credit risk, the depreciation of the kuna automatically weakens capital adequacy since banks' capital is expressed in kuna, and assets are mainly expressed in euros (Figure 109). Assuming no additional measures are taken to increase capital, the scenario projects that by end-2014 the capital adequacy ratio would fall below 12% for ten banks holding around 9% of banking sector assets. Five banks holding about 2% of banking sector assets would have a capital adequacy ratio lower than 8% (Figure 109).¹⁹

Finally, standard indicators of latent difficulties in credit risk management in the banks' portfolio indicate that caution is warranted in interpreting the results of the resilience analysis. The share of sector assets concentrated in banks which in the period of income erosion assessed growth in credit quality or had a relatively weak coverage with a parallel below-average level of non-performing loans is kept at around 10%, the amount it came to at the end of 2012 (Figure 110). However, on the other hand, the resilience analysis results, which are somewhat worse than normal, need to be put in context of the increase in the coverage of non-performing loans. At the end of 2014 alongside projected trends of non-performing loans and their value adjustments, the coverage of non-performing loans would rise considerably (from 43% at the end of September 2013 to around 48% at the end of December 2014 under the baseline scenario) which would have a positive impact on financial stability and decrease the burden on capital created by uncorrected non-performing loans (Figures 99 and 101).

¹⁹ This presumption implies the absence of major activities in the process of collection of non-performing loans.

Box 4 Analysis of short-term resilience of the banking sector to liquidity shocks

Liquidity risk, or the inability of a credit institutions to meet its financial obligations in time, due to the maturity mismatches in the balance sheet, was never a special focus of commercial bankers, regulators and supervisors until the recent global financial crisis¹. Credit and market risks were up to that moment identified as major dangers for a safe and undisturbed functioning of financial systems. Maturity mismatch of assets and liabilities of individual financial institutions was mostly considered an idiosyncratic risk, and so the systemic component that may arise from the tightened liquidity position of a certain institution and may through mutual market exposures (contagion risk) easily be transferred to the rest of the system was mostly neglected². Such an approach to liquidity risk was partially a consequence of an extremely rare historical experience with liquidity crises,³ especially those on a global level.

However, after the escalation of the great financial crisis in the fall of 2008 the mainly tolerant stance towards liquidity risk changed considerably. In conditions of extremely high uncertainty and lack of confidence in global financial markets, the capacity of financial institutions to turn a certain form of assets into cash at a specific price in the short term (market liquidity risk) almost completely disappeared. With the closing of financial markets, the possibilities of credit institution financing significantly decreased (funding liquidity risk). Due to the coordinated activities of banks which through assets fire sales tried to obtain the funds necessary for financing regular business, this had a negative effect on market conditions, causing a liquidity spiral which led to the need for implementation of unconventional measures of central banks and governments with the aim of maintaining the stability of financial systems. Needs and initiatives for closer monitoring and action in the direction of limiting liquidity risk emerged on national and international levels.

The new international regulatory framework⁴ is aimed, for the first time, at the formation of adequate liquidity reserves at the individual institution level as well as at the overall financial system level; this will, in conjunction with capital buffers, increase the resilience of credit institutions to potential future shocks. For that purpose two new international liquidity standards were defined, namely liquidity coverage ratio (LCR) and net stable funding ratio (NSFR)⁵. The beginning of the gradual implementation of the liquidity coverage ratio on the level of the European Union is planned for 2015, when the binding regulatory minimum will amount to 60%. The full implementation in the amount of 100% is

1 Prior to the outbreak of the crisis, certain measures aimed at formation of adequate, primarily foreign currency, liquidity buffers (minimum required foreign currency claims of banks) were adopted in Croatia.

2 De Larosière Group, De Larosière Report February 2009.

3 Liquidity crises are exceptionally rare events. However, the impact and consequences of those crises are extremely large (Tabak, B. M. et al.: *Stress Testing Liquidity Risk: The Case of the Brazilian Banking System*, Working Paper Series 302, December 2012).

4 For more on the new regulatory framework see Box 5 Monitoring systemic risk and designing macroprudential policy.

planned for 2018. The implementation of that liquidity requirement in Croatia is planned for 2015. Up to its full implementation in the amount of 100%, liquidity risk will continue to be monitored by means of the existing national requirement (minimum liquidity coefficient⁶) together with the liquidity coverage ratio. Alongside new quantitative requirements, special attention of regulators is directed to the creation of an adequate system for testing the resilience of financial institutions; this will, together with capital and market shocks, integrate liquidity shocks as well. This research aims at testing the resilience of the domestic banking sector to liquidity risks and determine the adequacy of the current liquidity policies of domestic banks for the implementation of new regulatory requirements.

The liquidity coverage ratio is used in this research as a measure for transferring simulated liquidity shocks to banks' balance sheets and for determining the adequacy of formed liquidity reserves in order to determine the possible effects of its implementation on the domestic banking sector⁷. In contrast with the net stable funding ratio, which aims at improving the long-term, structural liquidity profile of credit institutions, the liquidity coverage ratio aims at improving their short-term liquidity. Namely, this standard prescribes the maintenance of liquidity reserve levels appropriate for the coverage of a possible imbalance between expected liquidity inflows and outflows in extremely stressed conditions during one month. It is actually a ratio of the amount of high-quality unencumbered liquid assets available in stressed conditions (HULA) and total net liquidity outflows (NLO)⁸ determined in line with the defined parameters of a stressed scenario (w_{LCR})⁹.

$$LCR = \frac{HULA}{NLO} = \frac{HULA}{outflows - \min(inflows; 0,75 * outflows)}$$

5 That liquidity requirement has not yet been completely defined, so the beginning of its implementation is planned for 2018.

6 Decision on liquidity risk management

7 Banking data for the calculation of the liquidity coverage ratio in Croatia are still not collected directly. So the available supervisory data collected for the needs of reporting on minimum liquidity coefficient on 30th June 2013 were used for the calculation of that standard. Since those data are not completely in line with the liquidity coverage ratio methodology, the calculated LCRs in this research are used as an approximation of the banks' liquidity position and possible deviations from the real liquidity profile are taken into consideration in interpretation of individual results.

8 The liquidity standard defined in this way requires the banks not to rely, in fulfilling it, solely on expected liquidity inflows during the observed period; at least 25% of expected liquidity outflows need to be covered with high-quality liquid assets.

9 The amount of high-quality liquid assets (HULA) and net liquidity outflows is determined by multiplying certain forms of balance sheet and off-balance sheet liabilities (L_i) and assets (A_i) of a credit institutions (i) with expected outflow/inflow rates (w_{LCR}) during one month, and which are proscribed in the regulation (CRD4/CRR and Basel III):

$$\begin{aligned} HULA_i &= \sum_j (A_{ji} * (1 - w_j LCR)) \\ outflows_i &= \sum_j (L_{ji} * w_j LCR) \\ inflows_i &= \sum_j (A_{ji} * w_j LCR). \end{aligned}$$

The level of proscribed inflow/outflow rates is calibrated based on the experience during the great financial crisis and makes a combination of historical idiosyncratic and systemic shocks.

In defining highly liquid financial assets a conservative approach was used which considers currency, deposits with the central bank and government debt securities to be highly liquid assets of a credit institution.¹⁰

In mid-2013 the domestic banking system was assessed as highly liquid according to both current and new regulatory requirements, with kuna and foreign currency liquidity at system level above regulatory minimum (Table 1, Figure 72, Banking sector). According to the new regulation the level of liquidity reserves required to amortise shocks similar to those in the financial crisis was somewhat lower, especially in the foreign currency segment. Those results are primarily the consequence of the methodological construction of the new requirement, which implies a considerably narrower and more restrictive definition of high-quality liquid assets and a stronger decrease in expected liquidity inflows in relation to the decrease in liquidity outflows.

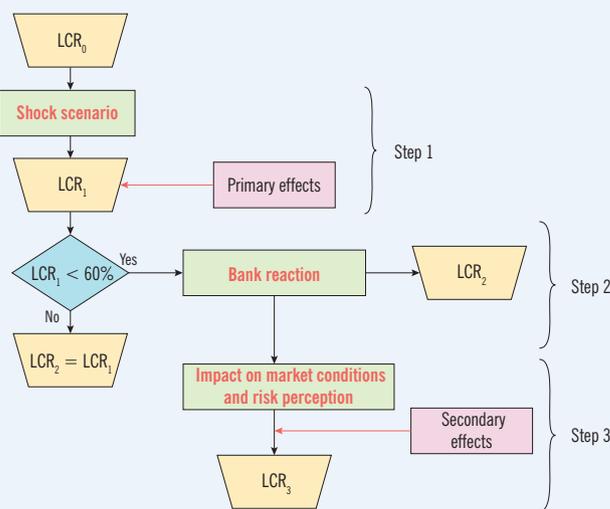
Table 1 Indicators of the banking sector liquidity, end-June 2013

	Current regulatory requirement	New regulatory requirement
	Minimal liquidity coefficient	Liquidity coverage ratio
	Average MLC	Average LCR
Regulatory minimum	1	60%
Kuna liquidity	1.7	128%
Foreign currency liquidity	1.8	100%

Note: The application of the new regulatory requirement of 60% is envisaged for the beginning of 2015. The current regulatory requirement shall remain in effect until 2018, i.e. the full application of the liquidity coverage ratio. Liquidity standards show the weighted average of the banking sector, with the shares of individual banks in total sector assets at end-June 2013 being used as weights.
Source: CNB.

However, standardised liquidity indicators need to be complemented with adequately constructed and applied techniques of analysis of the resilience of credit institutions to liquidity shocks, providing additional insight into the adequacy and liquidity of formed reserves. Liquidity shocks simulated in this research include change of market liquidity and the possibility of financing and they are expressed through five scenarios: fall in value of securities of the Republic of Croatia, withdrawal of private sector deposits, drawdown of credit and liquidity lines that the banks granted to clients, loss of financial support from parent banks and the combination of those individual shocks. The applied methodological framework¹¹ of resilience analysis of the domestic banking sector to those liquidity risks comprises three mutually interrelated steps (Figure 1).

Figure 1 Schematic outline of the testing of banking sector resilience to liquidity shocks



Source: CNB.

In the first step the simulated shocks are transferred to high-quality liquid assets and banks' net liquidity outflows through a decrease in the rates of expected inflows ($w_{j,LCR} = w_{j,LCR} - \Delta w_{j1}$), i.e. an increase in rates of expected outflows ($w_{j,LCR} = w_{j,LCR} + \Delta w_{j1}$) in relation to the initial rates defined in the LCR, which in turn decreases the liquidity coverage ratio of banks (primary effects). In determining shocks it is important to point out that regulatory liquidity inflow/outflow rates are determined according to the recent crisis experience, so they reflect exceptionally rare events. ($w_{j,LCR} \approx 3\sigma$). Therefore the change in their size, i.e. the intensity of simulated shocks, is calibrated by the random generation of rescaled log-normal distribution¹²:

$$\Delta w_{j1} \sim \text{Exp}\left(N(0, 1) * \frac{w_{j,LCR}}{3}\right).$$

It is assumed that the simulated distribution represents a range of intensities of impact that a specific liquidity shock could have on liquidity inflows/outflows during a one-year period. The simulated distribution is therefore divided into twelve equal parts. With each subsequent month of the duration of the stressed scenario, the change of liquidity inflows/outflows, i.e. the intensity of the shock, increases exponentially in relation to the liquidity inflows/outflows in the initial period. With regard to the focus of the LCR indicator on forming liquidity buffers sufficient for surviving a month-long stressed period, the intensity of the simulated shock is determined in the first position of the simulated distribution (Figure 2).¹³

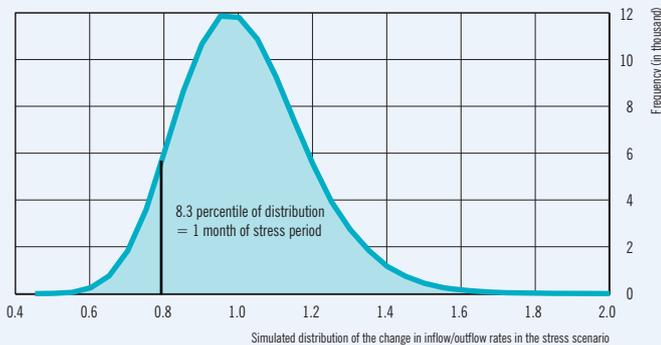
Initial shocks in the forthcoming steps are propagated through the sector via more or less coordinated activities of a certain number of

¹⁰ The amounts allocated on the basis of reserve requirements are not included in highly liquid assets.

¹¹ Methodological framework mainly follows the work of Van den End, J. W. and Kruidhor, M.: *Modelling the liquidity ratio as macroprudential instrument*, DNB Working Paper 342, April 2012.

¹² Log-normal distribution, which is extremely asymmetric and skewed to the right, is used because liquidity shocks are extremely rare and non-linear events.

Figure 2 Example of the simulated distribution of the change in money outflow/inflow rates in the stress scenario



Note: Initial inflow/outflow rate is 50%.
Source: CNB.

banks which adjust their balance sheet¹⁴ in order to compensate the initial loss of liquidity and to return liquidity buffers above the regulatory minimum. However, the reactions of certain banks for the purpose of improving liquidity profiles may have an adverse feedback effect on conditions in the markets in which the banks operate, which transfers the initial liquidity shocks endogenously to balance sheets of all other banks in the system causing secondary, systemic effects¹⁵ (indirect contagion risk). Alongside systemic effects, banks' reactions may also pose an idiosyncratic, reputation risk to those banks.¹⁶ Both secondary effects are transferred to banks' liquidity buffers via additional increases/decreases in liquidity outflow /inflow rates:

$$w_{jsim2} = w_{jsim1} \pm \Delta w_{j2}$$

The strongest individual impact on banking sector liquidity in the first step comes from private sector deposit withdrawal (average decrease of the sector LCR indicator is -23.8%), and it is followed by the fall in value of debt securities of the Republic of Croatia (average decrease by -22.1%). The effect of drawdown of granted liquidity and credit lines and the possibility of financing from parent banks is significantly lower

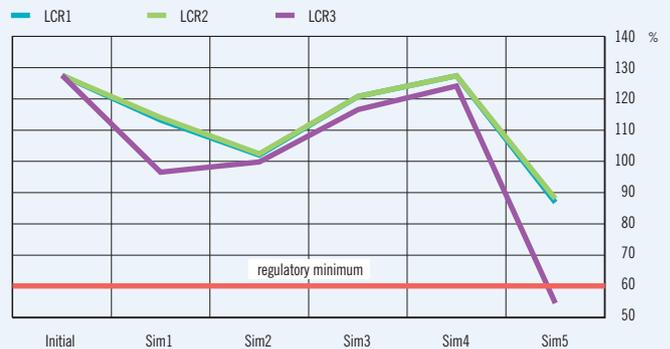
13 Simulated shocks in the first step include the decrease in the value of securities of the Republic of Croatia by 25 p.p. (sim1), increase in the private sector foreign exchange outflow by an average of 14 p. p. (sim2), increase in the outflow of funds from granted credit and liquidity lines by an average of 5 p. p. (sim3), decrease in the possibility of financing from parent banks by an average of 47 p. p. (sim4) and their combination (sim5). All changes are expressed in relation to proscribed stressed parameters used for the construction of the initial LCR indicator (CRD4/CRR, Basel III).

14 The reaction of affected banks in the short term includes shortening of the assets maturity and/or extension of liabilities maturity, where the amount and form of the reaction depend on the loss of liquidity buffers in the first step, the structure of certain bank's balance sheet and the prevailing market conditions following the initial shock.

15 The intensity of secondary effects is determined by the number of banks that react, the size and the similarity of their reactions and the exogenous market conditions that determine the availability of market financing.

16 Reputation risk is determined by the relative size of the banks' reaction in relation to total assets and the level of distortion in a certain market.

Figure 3 Average LCR at the banking sector level after the simulation of stress scenario, kuna segment



Source: CNB.

Figure 4 Average LCR at the banking sector level after the simulation of stress scenario, foreign currency segment



Source: CNB.

(-3.4% and -1.4% respectively), which is partly a consequence of the definition of the applied liquidity standard. As expected, the combination of all individual shocks has the most destructive impact on banking system liquidity. However, in the case of their simultaneous occurrence the kuna liquidity of the banking system would be satisfactory after the primary effects, while today the foreign currency liquidity would be on the margin of the regulatory minimum (Figures 3 and 4). The primary effects of tested liquidity shocks have a considerably greater impact on kuna liquidity in relation to secondary effects, which is expected considering the predominant focus of banks on traditional business,¹⁷ while that relation is to the contrary in the foreign currency segment. That is, among other things, a consequence of a significantly reduced space (instruments and market) for the reaction of banks in the foreign currency part.

17 Dominant share of deposit and credit activities

The results of the research¹⁸ indicate that the domestic banking system in mid-2013 was exceptionally liquid in accordance with current, but also in accordance with new liquidity requirements. The application of more restrictive liquidity standards, which is imposed by the new European regulatory framework, will probably not considerably change the banking sector liquidity profile, presuming that the current structure of banks' balance sheets is maintained and that strong liquidity shocks do

not occur. Analysis of banking sector resilience to shocks showed that potentially the greatest effect on loss of liquidity reserves comes from the private sector deposit outflow, followed by risks arising from relatively high exposure of banks to the government sector. However, even if such highly stressed scenarios do occur, which is exceptionally rare in reality, the domestic banking sector would maintain a satisfactory level of kuna and foreign currency liquidity.

¹⁸ In assessing the results of this research one needs to bear in mind the mentioned data, methodological and other limitations, due to which this research provides only a framework image of liquidity levels of the domestic banking sector.

Box 5 Monitoring systemic risk and designing macroprudential policy

1 Reform of the financial regulatory framework

The recent global financial crisis uncovered the necessity of a macroprudential approach to financial system analysis, one that assumes considering and supervising the financial system as a whole, since a significant share of systemic risks has proved to arise from the system itself, independent of the risks to and stability of individual financial institutions. This particularly refers to the pro-cyclicality of the previous regulatory framework, and this, alongside financial system elements that increased the intensity of shocks and expanded quickly in an open, integrated economy, explains why economic crises are deeper and longer-lasting when accompanied by financial crises.¹ Recent studies have assessed that losses related to financial crises move in the range from 0.5% to 5% of global GDP, while the potential loss of production and real social costs exceed those amounts by far.² Thus monitoring systemic risks is important for a precise identification of the processes of their cumulation and the real danger of their materialization, which was not present in classic supervision. So it became clear on global level that there is a need for amendment of the existing regulation and for the establishment of an effective framework for managing macroprudential policy that will enable the prevention, mitigation and avoidance of systemic risks and the strengthening of system resilience to financial shocks.

At a European Union level the management of macroprudential policy has been confided to the European Systemic Risk Board – ESRB, which is in charge of considering and assessing systemic risks with the aim of preventing and mitigating future distortions in the financial system that might have serious negative consequences for the financial system and real economy and with the aim of increasing financial system resilience to sudden shocks. With its recommendations the ESRB³ actively participates in the process of the development of institutions and instruments for the implementation of macroprudential policies in member countries.

Within those institutional reforms, a new European regulatory framework was developed; it has adopted new and stricter international standards for capital and liquidity risk management (Basel III⁴). In Croatia it was established in Regulation (EU) no 575/2013 of the European Parliament and Council on prudential requirements for credit institu-

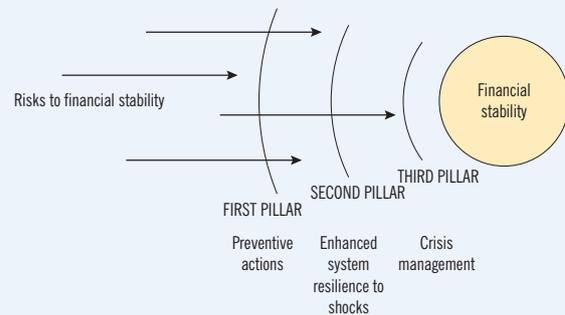
1 D. Miles, *Monetary policy and forward guidance in the UK*, Speech at Northumbria University, Newcastle, 2013, available at the web site of the Bank of England,

2 D. Kapp and M. Vega, *Real output costs of financial crises: a loss distribution approach*, MPRA Paper No. 38988, 2012, A. G. Haldane: *The \$100 billion question*, comment by Andrew G. Haldane (executive director), Financial Stability, Bank of England, Institute of Regulation & Risk, Hong Kong, BIS Review 40/2010.

3 In March 2013 the ESRB issued the Recommendation on intermediate objectives and instruments of macro-prudential policy (ESRB/201371) which defines intermediate objectives that will make macroprudential policy operative and transparent, while also approximate list of macroprudential policy instrument is proposed.

4 International regulatory framework for banks (Basel III), available at: <http://www.bis.org/bcb/basel3.htm>.

Figure 1 Three "lines of defence" of financial stability



Source: Žugjić, R. and N. Fabris (2010): *Finansijska stabilnost kao cilj centralnih banaka*, *Aktuelna pitanja crnogorske ekonomije*, Centralna banka Crne Gore.

tions and investment firms (Capital Requirements Regulation – CRR),⁵ which is directly applicable in countries, and through the adoption of the new Credit Institutions Act,⁶ by means of which Directive 2013/36/EU of the European Parliament and Council on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms (Capital Requirements Directive IV – CRD4) is transposed into the domestic legislative framework.⁷ This radically redesigned the domestic institutional framework, which should ensure the implementation of macroprudential policy, integrated with the traditional approach of microprudential regulation and supervision. The CNB, which, prior to these reforms was in the forefront even in global terms in the timely creation of adequate systemic risk buffers, has, with the new regulation, a new set of instruments at its disposal, which should enable a more effective implementation of macroprudential policy.

One of the problems that the recent financial crisis clearly indicated is the absence of coordination among the regulatory bodies that cover different parts of the financial system. So the ESRB by its recommendations initiated the formation of macroprudential bodies whose primary task is to coordinate macroprudential supervision among different regulators within the country, to cover the potentially directly irregular parts of the system and to coordinate within the EU. At the end of December 2013 the Croatian parliament adopted the Act on the Financial Stability Council,⁸ which establishes an inter-institutional body comprising representatives of the CNB, of the Croatian Financial Services Supervisory Agency, of the Ministry of Finance of the Republic of Croatia and of the State Agency for Deposit Insurance and Bank Rehabilitation. It will provide assistance in harmonising different policies, coordination of

5 REGULATION (EU) No 575/2013 (<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2013:176:0001:0337:EN:PDF>)

6 Credit Institutions Act, OG 159/2013.

7 DIRECTIVE 2013/36/EU (<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2013:176:0338:0436:EN:PDF>)

8 Act on the Financial Stability Council, OG 159/2013.

assessment, consideration and systemic risks mitigation activities and communicating with the general public. Additionally, steps are taken in the direction of formalising cooperation in terms of crises situation resolution. This completes the institutional framework that supports financial system stability (Figure 1).

2 Instruments and objectives of macroprudential policy

The primary objective of macroprudential policy is to contribute to the maintenance of financial system stability as a whole by strengthening system resilience and by preventing and decreasing systemic risks, which supports the contribution of the financial system to economic growth.

To identify systemic risks means to determine their nature (structural or cyclical), location (segment of the system in which they develop) and source (for example, whether they reflect more disruptions on the supply side or on the demand side). With regard to such diagnostics, instruments are optimised and intensity of measure is calibrated which should cover risks most efficiently, reduce regulatory risk of inaction bias and minimise potential negative spillovers to other sectors as well as unexpected cross-border effects.

In this context the regulation defines the following intermediate objectives of macroprudential policy (which at the same time determines also the indicators which serve for monitoring disruptions):

- 1) to mitigate and prevent excessive credit growth and leverage (assumes the activation of instruments such as countercyclical capital buffer, loan to value, loan to income, structural systemic risk buffer, capital conservation buffer and leverage ratio);
- 2) to mitigate and prevent excessive maturity mismatch and market illiquidity (assumes activation of instruments such as net stable funding ratio, loan to deposit ratio, liquidity coverage ratio, other liquidity requirements);
- 3) to limit direct and indirect exposure concentration (assumes activation of instruments such as sectoral capital requirements, structural systemic risk buffer);
- 4) to limit the systemic impact of misaligned incentives with a view to reducing moral hazard (assumes activation of instruments such as buffers for systemically important institutions, structural systemic risk buffer, capital conservation buffer, additional liquidity requirements for systemically important institutions);
- 5) the strengthening of financial infrastructure resilience.

3 Specificities of major macroprudential instruments and their implementation in Croatia

The main change that the regulation brings is the definition of the obligation to maintain the required capital buffers⁹:

- 1) Minimum regulatory capital adequacy ratio is 8% and comprises three parts: (i) common equity tier 1 capital: 4.5%, (ii) additional tier 1 capital :1.5%, (iii) tier 2 capital : 2%.

Figure 2 Range of the capital buffers and steps of their implementation



Note: Countercyclical capital buffer and structural systemic risk buffer have no real upper limit, but the overrun of the 'normal' limit is aggravated by procedures and regulations for their implementation.
Source: CNB.

2) Additional capital requirement is composed of buffers:

- (a) capital conservation buffer (Conserv. b.),
- (b) countercyclical capital buffer (CCB),
- (c) structural systemic risk buffer (SRB),
- (d) capital buffers for global systemically important institutions (G-SII),
- (e) capital buffers for other systemically important institutions (O-SII).

The size of the additional combined capital requirement¹⁰ (which refers to the adequacy rate of the Common Equity Tier 1 capital) depends on the calibration of certain instruments (on the identification of systemic risks in the economy) according to the legally defined nomograph (Figure 2).

The purpose of the capital conservation buffer is to accumulate capital in a phase of positive financial and economic conditions, which will then, in a period of financial and economic stress, absorb losses and enable credit institutions to continue with their regular operations, without compromising minimum capital adequacy. That is the regulatory capital that a credit institution is obliged to maintain in the amount of 2.5% of the total amount of risk exposure in the form of the common equity tier 1 as of 1st January 2014.

The Structural systemic risk buffer is introduced for the purpose of protection against systemic risks that do not depend on cycles. The rate of

⁹ Details on technical standards and reporting forms of credit institutions on regulatory capital and capital buffers: COMMISSION IMPLEMENTING REGULATION (EU) no. 1423/2013 (<http://www.hnb.hr/propisi/odluke-nadzor-kontrola/eu/h-uredba-komisije-eu-JK-1423-2013.pdf>);

¹⁰ They are also required in addition to the greater capitalisation of credit institutions imposed by supervisory measures.

the structural systemic risk buffer is defined by the CNB for all credit institutions or for one or more subsets of credit institutions with the aim of preventing or mitigating structural systemic risks. That is the regulatory capital that a credit institution is obliged to maintain in the amount of 1% or 3% (depending on the assessed complexity of its operations¹¹) of the total amount of risk exposure in the form of the common equity tier 1 as of 1st April 2014.

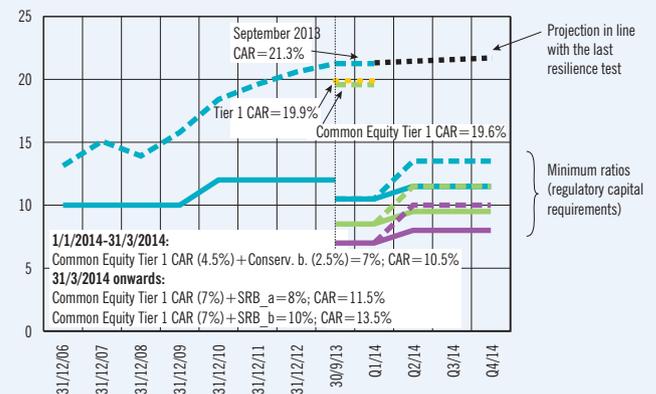
A credit institution must in the form of the common equity tier 1 also maintain the countercyclical capital buffer, which is introduced with the aim of accumulating capital in the phase of excessive credit growth, in order for that capital to be able to absorb losses in phases of stress that might arise due to excessive credit growth (planned enforcement is 1st January 2015, in the amount which reflects the overheating of credit growth). The specific rate of the countercyclical capital buffer for a single credit institution is calculated as a weighted average of countercyclical capital buffers which are defined and published for Croatia, other member countries and third countries in which that credit institution has relevant exposures.

With the aim of forming additional capital in case of distortion in or termination of operations of a credit institution, which may lead to systemic risk, in the case of globally systemically important and other systemically important credit institutions, the capital buffer for systemically important institutions must be applied, also in the form of the common equity tier (planned enforcement is 1st January 2016). Global systemically important credit institutions are determined on the basis of the group size, the connection of the group with the financial system, replaceability of services or financial infrastructure that the group ensures, the complexity of the group and the group's cross-border activity. Based on their characterisation, the global systemically important credit institutions have to maintain the buffer in the amount of 1% to 3.5%, depending on classification. Other systematically important institutions, whose importance is assessed on the basis of similar indicators, have to maintain the buffer in the amount of 0% to 2% of the total risk exposure.

Implementation of capital buffers for domestic credit institutions at the beginning of 2014 brings the easing of measures through the decreased capital adequacy ratio by 1.5%. Specifically, the minimum proscribed capital adequacy ratio is increased only by the capital conservation buffer of 2.5% so the minimum capital adequacy ratio is 10.5%. The banking system is well capitalised (CAR on 30th September 2013 = 21.3%), and institutions have no difficulties in satisfying that requirement. However, the structure of regulatory capital is not equal in all individual credit institutions, so with the additional capital requirement for structural systemic risk in the amount of 1%, and 3% as of April 2014, that pressure of capital structure adjustment will increase slightly for a smaller part of the system. Despite that, on the consolidated level (aggregated balance sheet) still there are no signs of difficulties in fulfilling that requirement since the total capital adequacy ratio for all credit institutions exceeds the limit of 11.5% or 13.5% (Figure 3).

11 Up to the moment of implementation of capital buffers for other systemically important institutions, the CNB shall rely on indicators of complexity of credit institution operations, such as the relative size of assets, the significance of interbanking transactions, i.e. risks of systemic distortions, contagion risks and reputation related risks.

Figure 3 Projecting capital requirements in 2014



Source: CNB.

During the recent crisis liquidity risks proved to be extremely destabilising elements. Therefore the Regulation, alongside capital buffers, imposes the obligation to form and maintain adequate liquidity buffers of credit institutions required for amortisation of potential future liquidity shocks. This is a consequence of, among other things, the inadequate systemic preventive activity aiming at limiting exposures to those risks, partly due to the fact that their systemic impact was neglected in the past because of the extremely rare occurrence of liquidity risks.

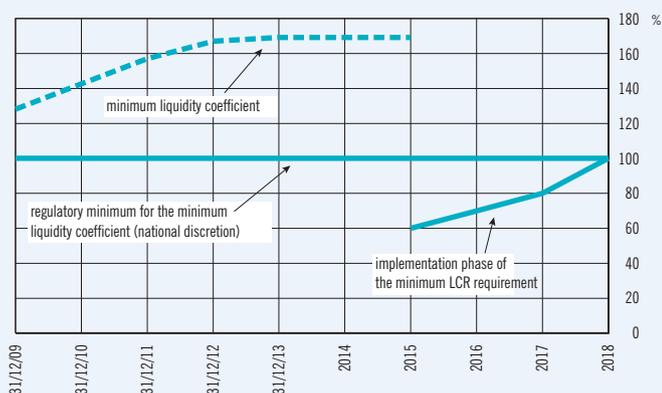
The new regulatory model defines two international liquidity standards:

- 1) liquidity coverage ratio (LCR), which aims at improvement of the short-term liquidity positions of financial institutions by forming liquidity reserves adequate to cover possible imbalances between liquidity inflows and outflows in extremely stressed conditions during one month,
- 2) net stable funding ratio (NSFR) which aims at long-term, structural improvement of liquidity positions of credit institutions.

Those standards create liquidity buffers since, in stressed conditions, financial institutions will be able to temporarily decrease their level below the required regulatory minimums.

The beginning of the gradual implementation of liquidity coverage ratios at the level of the European Union is planned for the beginning of 2015, when the minimum that financial institutions will be obliged to maintain will amount to 60%. For each subsequent year an increase of minimum level by 10 percentage points is planned, and full implementation in the amount of 100% of coverage is planned for 2018. In that transitional period the CNB will use its discretionary right to maintain, alongside liquidity coverage ratios, the existing national liquidity requirements (minimum liquidity coefficient) as well. Although the level of liquidity reserves according to the current requirement (minimum liquidity coefficient) is extremely favourable (Figure 4), due to the considerably more restrictive definition of the liquidity coverage ratio, the meeting of the proscribed minimum regulatory levels will require a certain adjustment of the balance sheets of some banks. It is thus necessary to promptly and yet gradually implement phase adjustments to the new regulation in order to avoid idiosyncratic, but also potential systemic, distortions

Figure 4 Projecting liquidity requirements until 2018



Source: CNB.

though its implementation. On the other hand, the stable funding ratio has not yet been completely defined, so the beginning of its implementation is planned for 2018.

Regulatory reforms, besides obvious benefits which should help in decreasing market imperfections, involve certain risks that may have counter-effects that need to be taken into consideration when preparing adequate macroprudential solutions. For example, capital requirements for systemically important financial institutions could directly ensure privileged status to certain entities, creating a perception in public that they are “too big to fail”, which might artificially decrease (subsidize indirectly) the cost of their financing. At the same time, those processes would increase competitive pressure on credit institutions whose scope of business is relatively more modest, the burden of a voluntary increase in capitalisation possibly being too big for some of them. Furthermore, when capital buffers increase lending costs, the stepped-up operations of what is called shadow banking as well as speculative behaviours in other markets in search of yields are also possible. This also opens space for arbitrages within group of banks or in cross-broader transactions, which might be a potential source of instability. Additionally, if some credit institutions face certain challenges in meeting regulatory liquidity minimums, that would induce certain balance sheet adjustments from their side which could, on the other hand, have a feedback effect on profitability and level of capitalisation, so it is important to consider them in connection with other regulatory requirements (primarily capital). Those considerations will in the forthcoming years increasingly be at the centre of attention of macroprudential policy.

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Abbreviations and symbols

Abbreviations

bn	– billion
CAR	– capital adequacy ratio
CBS	– Central Bureau of Statistics
CCE	– Croatian Chamber of Economy
CDCC	– Central Depository & Clearing Company
CDS	– credit default swap
CEE	– Central and Eastern European
CES	– Croatian Employment Service
CICR	– currency-induced credit risk
CM	– Croatian Motorways
CNB	– Croatian National Bank
EAD	– exposure at default
EBA	– European Banking Authority
EC	– European Commission
ECB	– European Central Bank
EFSD	– European Financial Stability Facility
EIZG	– Institute of Economics, Zagreb
EMBI	– Emerging Market Bond Index
EMU	– Economic and Monetary Union
EONIA	– Euro Overnight Index Average
ERM	– Exchange Rate Mechanism
ESM	– European Stability Mechanism
EU	– European Union
EULIBOR	– Euro London Interbank Offered Rate
EUR	– euro
EURIBOR	– Euro Interbank Offered Rate
f/c	– foreign currency
FDI	– foreign direct investment
Fed	– Federal Reserve System
FINA	– Financial Agency
FRA	– Fiscal Responsibility Act
FSI	– financial soundness indicators
GDP	– gross domestic product
GFS	– Government Finance Statistics
HANFA	– Croatian Financial Services Supervisory Agency
HBS	– Household Budget Survey
HREPI	– hedonic real estate price index
HRK	– Croatian kuna
ILO	– International Labour Organization
IMF	– International Monetary Fund
m	– million

MoF	– Ministry of Finance
MRR	– marginal reserve requirements
NPLR	– ratio of non-performing loans to total loans
OECD	– Organisation for Economic Co-operation and Development
ON USLIBOR	– overnight US dollar London Interbank Offered Rate
pp	– percentage points
RC	– Republic of Croatia
ROAA	– return on average assets
ROAE	– return on average equity
RR	– reserve requirements
SDR	– special drawing rights
yoy	– year-on-year
ZIBOR	– Zagreb Interbank Offered Rate
ZSE	– Zagreb Stock Exchange

Two-letter country codes

BA	– Bosnia and Herzegovina
BG	– Bulgaria
CZ	– Czech Republic
EE	– Estonia
HR	– Croatia
HU	– Hungary
LT	– Lithuania
LV	– Latvia
MK	– The former Yugoslav Republic of Macedonia
PL	– Poland
RO	– Romania
SI	– Slovenia
SK	– Slovak Republic

Symbols

–	– no entry
....	– data not available
0	– value is less than 0.5 of the unit of measure being used
Ø	– average
a, b, c,...	– indicates a note beneath the table and figure
*	– corrected data
()	– incomplete or insufficiently verified data

